EnVision CT™

INJECTOR

Schematic / PCA Manual

Catalog Number: ESM 700 2

Quality for Life®

This manual is intended for use in conjunction with the *EnVision CT* Injector System Service Manual Catalog Number ESM 700 1

92401-T-129 Rev. B

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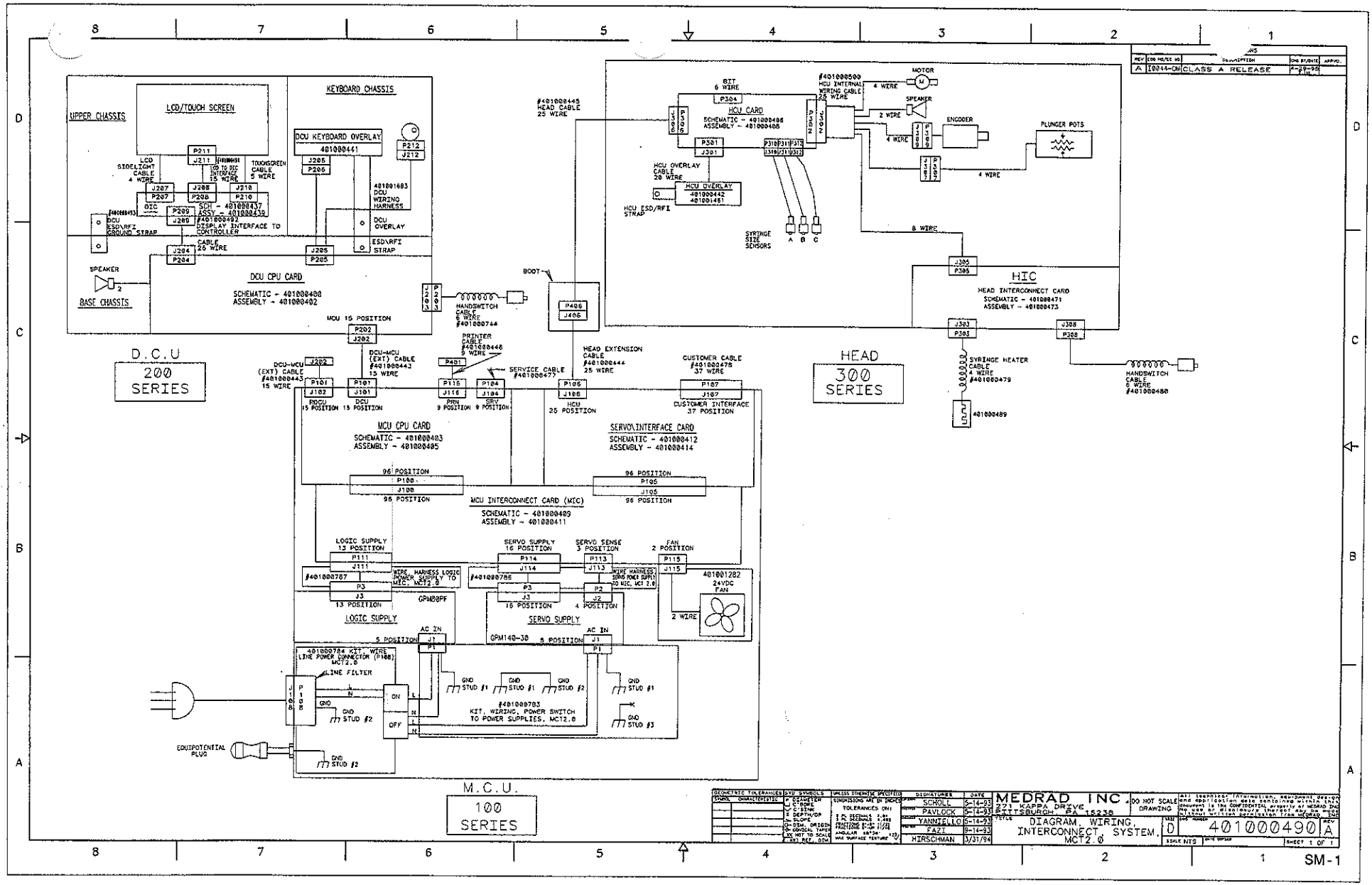
EnVision CT Injector System Schematic / PCA Manual
Table of Contents

SYSTEM INTERCONNECT WIRING DIAGRAM	401000490	SM - 1
DCU CPU CARD SCHEMATIC	401000400	SM - 2
DCU CPU CARD ASSEMBLY	401000402	SM - 6
DCU INTERCONNECT CARD SCHEMATIC	401000437	SM - 9
DCU INTERCONNECT CARD ASSEMBLY	401000439	SM - 10
MCU CPU CARD SCHEMATIC	401000403	SM - 12
MCU CPU CARD ASSEMBLY	401000405	SM - 16
MCU SERVO CARD SCHEMATIC	401000412	SM - 19
MCU SERVO CARD ASSEMBLY	401000414	SM - 23
MCU INTERCONNECT CARD SCHEMATIC	401000409	SM - 27
MCU INTERCONNECT CARD ASSEMBLY	401000411	SM - 28
MCU WIRING DIAGRAM	401000494	SM - 30
HCU CONTROLLER CARD SCHEMATIC	401000406	SM - 31
HCU CONTROLLER CARD ASSEMBLY	401000408	SM - 33
HCU INTERCONNECT CARD SCHEMATIC	401000471	SM - 35
HCU INTERCONNECT CARD ASSEMBLY	401000473	SM - 36
HCU WIRING HARNESS SCHEMATIC	401000499	SM - 38



REV	ECR NO/ECO NO	DESCRIPTION	ENG BY/DATE	APPVD.
A	I0044-ON	CLASS A RELEASE	4-29-94	

DESIGNATURES	DATE
SCHOLL	5-14-93
PAVLOCK	5-14-93
YANNIELLO	5-14-93
FAZI	9-14-93
HIRSCHMAN	3/31/94

MEDRAD INC.
271 KAPPA DRIVE
PITTSBURGH PA 15238

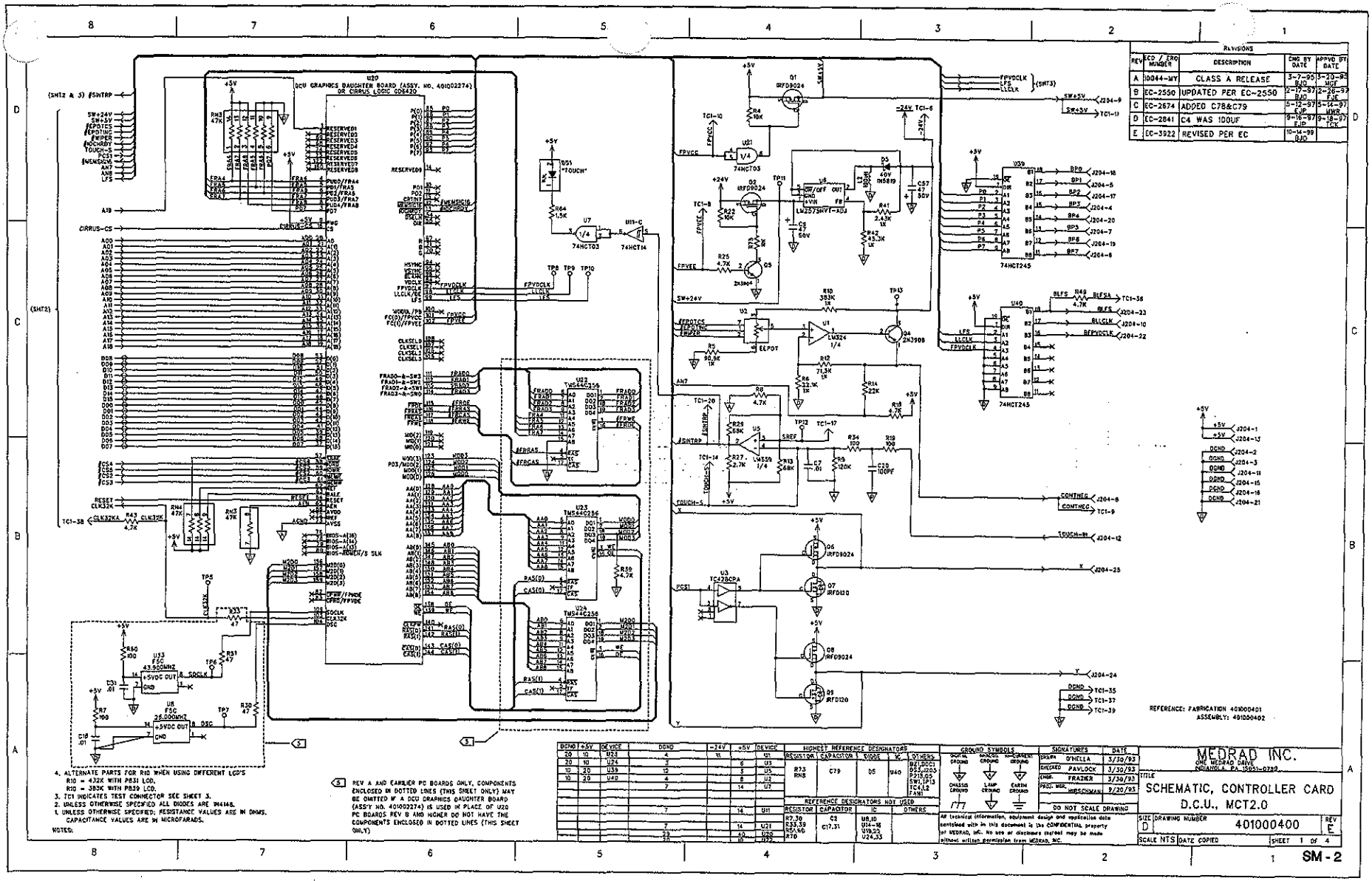
DO NOT SCALE DRAWING

DIAGRAM, WIRING, INTERCONNECT SYSTEM, MCT2.0

SIZE D | 401000490 | REV A

SCALE NTS | SHEET 1 OF 1

SM-1



REVISIONS				
REV	ECO / ERO NUMBER	DESCRIPTION	CHG BY DATE	APPVD BY DATE
A	10044-MY	CLASS A RELEASE	3-7-95 BJO	3-20-95 MGT
B	EC-2550	UPDATED PER EC-2550	2-17-97 BJO	2-26-97 FJR
C	EC-2674	ADDED C78&C79	5-12-97 E.VP	5-14-97 HWK
D	EC-2841	C4 WAS 100UF	9-16-97 EVP	9-18-97 TCK
E	EC-3922	REVISED PER EC	10-14-99 BJO	

NOTES:
1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS.
2. UNLESS OTHERWISE SPECIFIED ALL DIODES ARE 1N4148.
3. TC1 INDICATES TEST CONNECTOR SEE SHEET 3.
4. ALTERNATE PARTS FOR R10 WHEN USING DIFFERENT LCD'S
   R10 = 432K WITH PB31 LCD.
   R10 = 383K WITH PB39 LCD.

(3) REV A AND EARLIER PC BOARDS ONLY, COMPONENTS ENCLOSED IN DOTTED LINES (THIS SHEET ONLY) MAY BE OMITTED IF A DCU GRAPHICS DAUGHTER BOARD (ASS'Y NO. 401002274) IS USED IN PLACE OF U20. PC BOARDS REV B AND HIGHER DO NOT HAVE THE COMPONENTS ENCLOSED IN DOTTED LINES (THIS SHEET ONLY)

DGND	+5V	DEVICE
20	10	U22
20	10	U24
10	20	U33
10	20	U40

DGND	-24V	+5V	DEVICE
4			U1
3		6	U3
12		5	U5
4		8	U2
7		14	U7
7		14	U11
7		14	U21
23		40	U20
10		16	U12

HIGHEST REFERENCE DESIGNATORS

RESISTOR	CAPACITOR	DIODE	IC	OTHERS
R73 RN8	C79	D5	U40	BZ1,DC01 DS5,Q205 P213,Q5 SW1,TP13 TC4,L2 FAN1

REFERENCE DESIGNATORS NOT USED

RESISTOR	CAPACITOR	IC	OTHERS
R7,30 R33,39 R54,60 R70	C2 C17,51	U8,10 U14-16 U19,22 U24,33	

GROUND SYMBOLS: DIGITAL GROUND, CHASSIS GROUND, LAMP GROUND, EARTH GROUND

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SIGNATURES		DATE
DRAWN	O'NEILL	3/30/93
CHECKED	PAVLOCK	3/30/93
ENGR.	FRAZIER	3/30/93
PROJ. MGR.	HIRSCHMAN	9/20/93

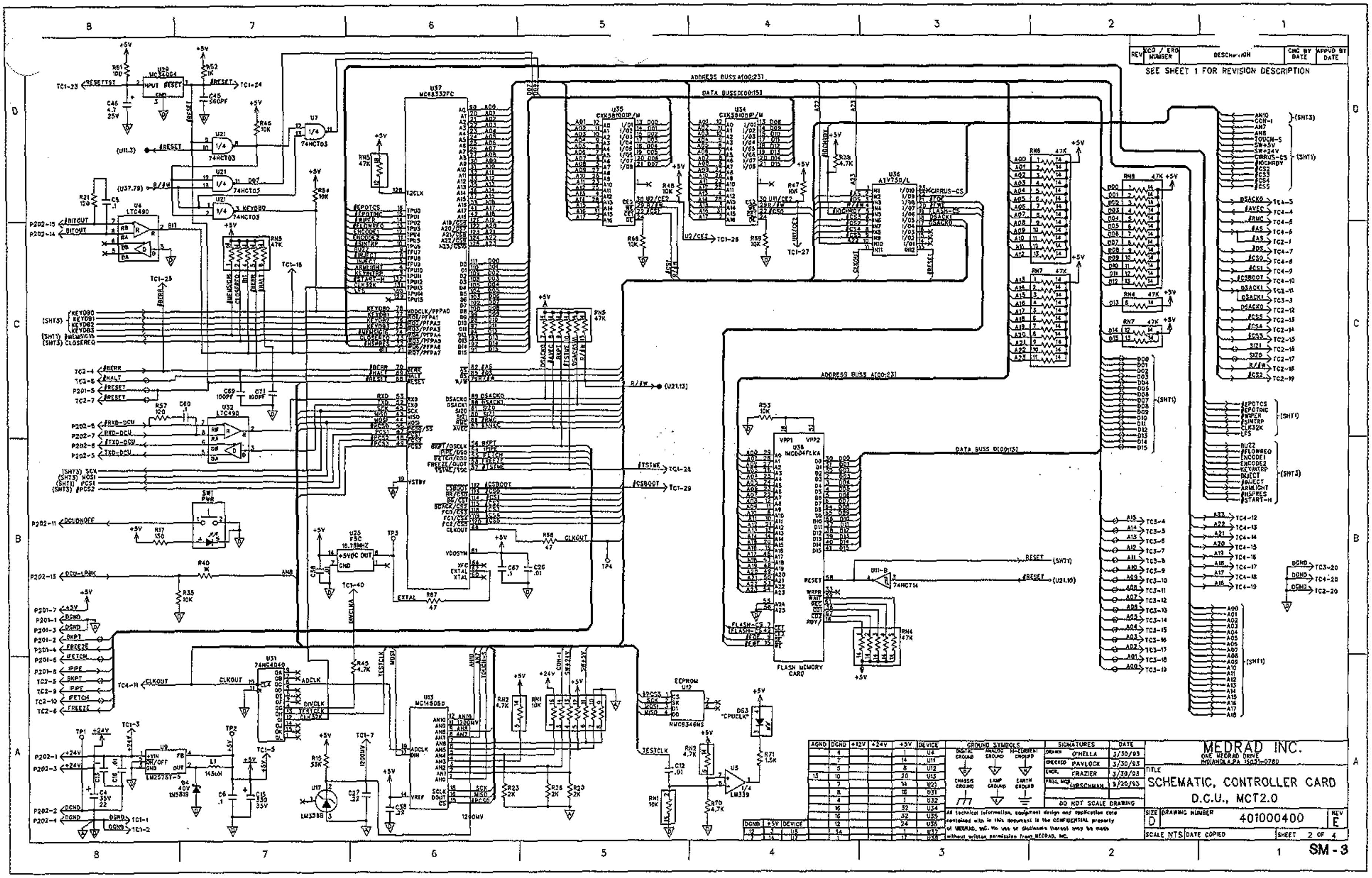
MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0782

TITLE: SCHEMATIC, CONTROLLER CARD D.C.U., MCT2.0

SIZE D | DRAWING NUMBER 401000400 | REV E

SCALE NTS | DATE COPIED | SHEET 1 OF 4

SM-2


SEE SHEET 1 FOR REVISION DESCRIPTION
MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780
SCHEMATIC, CONTROLLER CARD
D.C.U., MCT2.0
DRAWN O'HELLA 3/30/93
CHECKED PAYLOCK 3/30/93
ENGR. FRAZIER 3/30/93
PROJ. MGR. HIRSCHMAN 9/26/93
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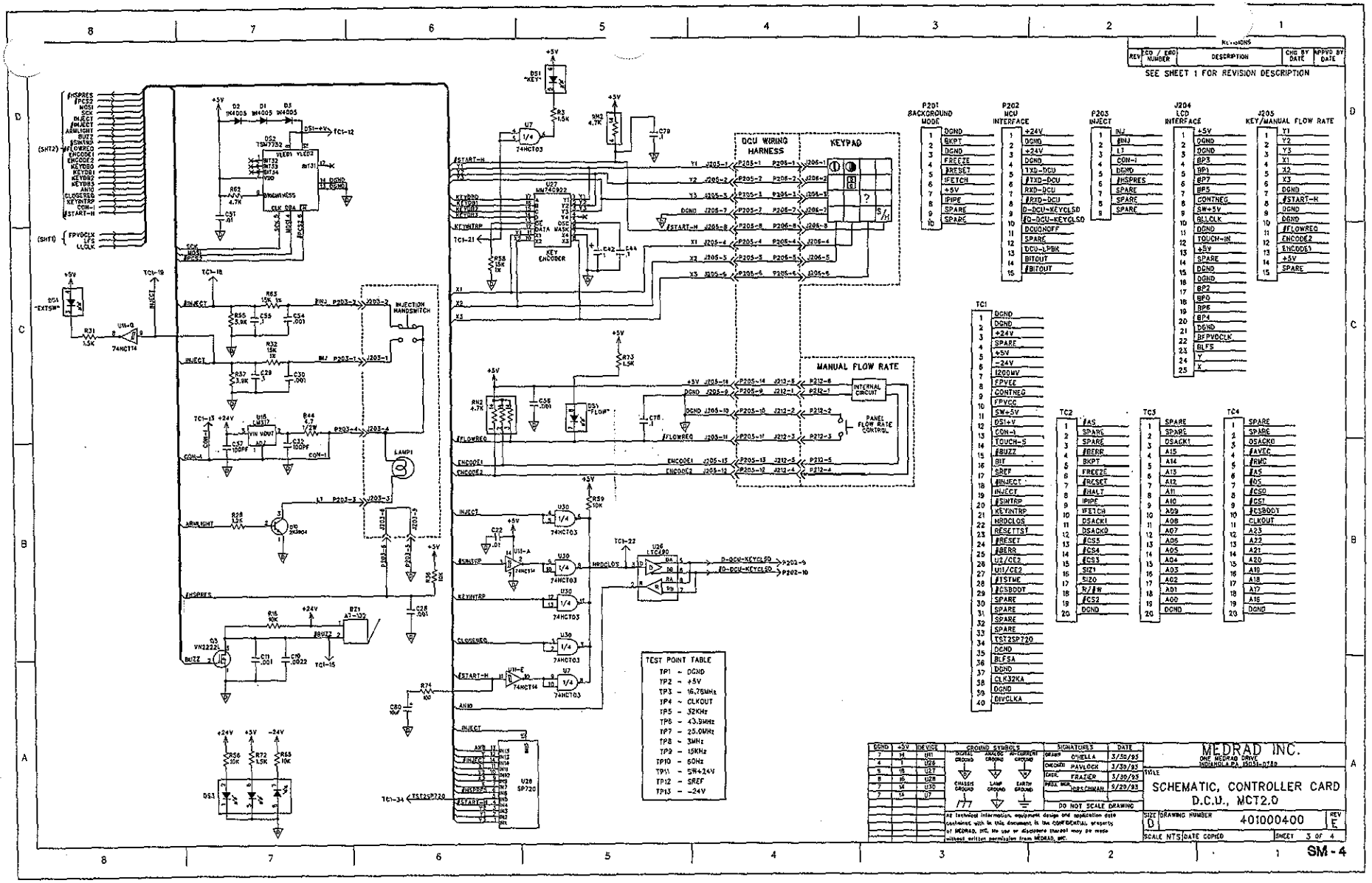
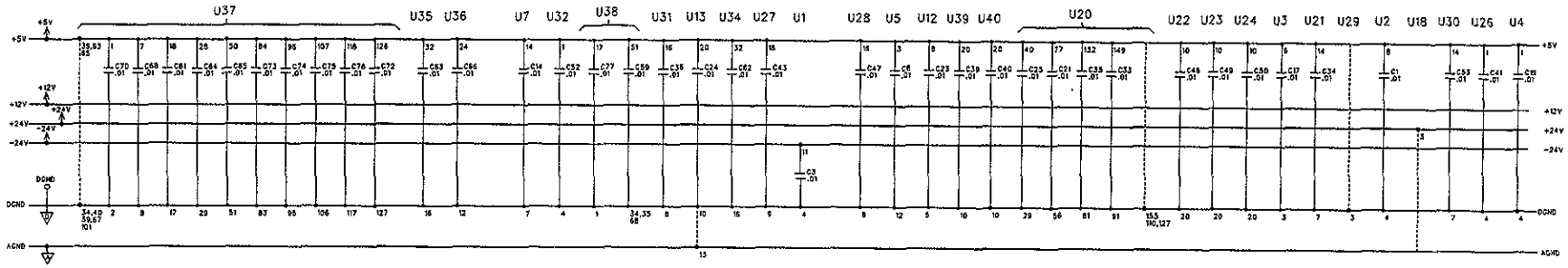
SIZE D
DRAWING NUMBER 401000400
REV E
SCALE NTS
SHEET 2 OF 4
SM-3

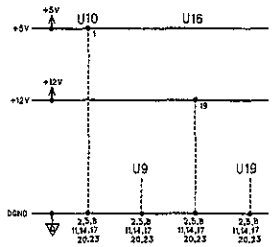

REVISIONS
REV | ECO / ECO NUMBER | DESCRIPTION | CHG BY DATE | APPVD BY DATE
SEE SHEET 1 FOR REVISION DESCRIPTION
P201 BACKGROUND MODE
P202 MCU INTERFACE
P203 INJECT
J204 LCD INTERFACE
J205 KEY/MANUAL FLOW RATE
DCU WIRING HARNESS
KEYPAD
MANUAL FLOW RATE
INJECTION HANDSWITCH
KEY ENCODER
TC1
TC2
TC3
TC4
TEST POINT TABLE
TP1 - DGND
TP2 - +5V
TP3 - 16.78MHz
TP4 - CLKOUT
TP5 - 32KHz
TP6 - 43.5MHz
TP7 - 25.0MHz
TP8 - 3MHz
TP9 - 15KHz
TP10 - 60Hz
TP11 - SW+24V
TP12 - SREF
TP13 - -24V
MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA PA 15051-0780
SCHEMATIC, CONTROLLER CARD
D.C.U., MCT2.0
SIZE D
DRAWING NUMBER 401000400
REV E
SCALE NTS
SHEET 3 OF 4
DO NOT SCALE DRAWING
SM - 4

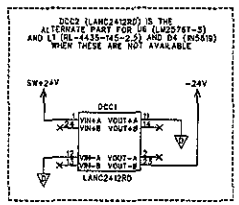
REVISIONS					
REV	ECO / ERO NUMBER	DESCRIPTION	CHG BY DATE	APPVD BY DATE	

SEE SHEET 1 FOR REVISION DESCRIPTION

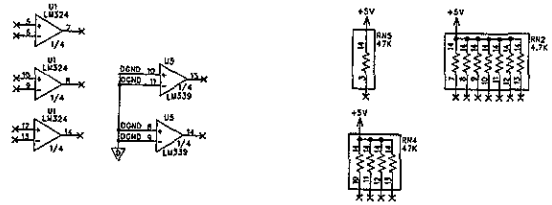


POWER & GROUND CONNECTIONS




DCC2 (LANC2412RD) IS THE ALTERNATE PART FOR U6 (LM2576T-5) AND L1 (RL-4435-145-2.5) AND D4 (IN5819) WHEN THESE ARE NOT AVAILABLE
SW+24V
-24V
DCC1
LANC2412RD

ALTERNATE PARTS



UNUSED GATES

GROUND SYMBOLS			SIGNATURES	DATE
DIGITAL GROUND	ANALOG GROUND	INSTRUMENT GROUND	DRAWN O'NEILLA	3/30/93
CHASSIS GROUND	LOOP GROUND	CARDIC GROUND	CHECKED PAVLOCK	3/30/93
			ENGR. FRAZIER	3/30/93
			PROJ. MGR. ROETCHMAN	9/20/93
			DO NOT SCALE DRAWING	

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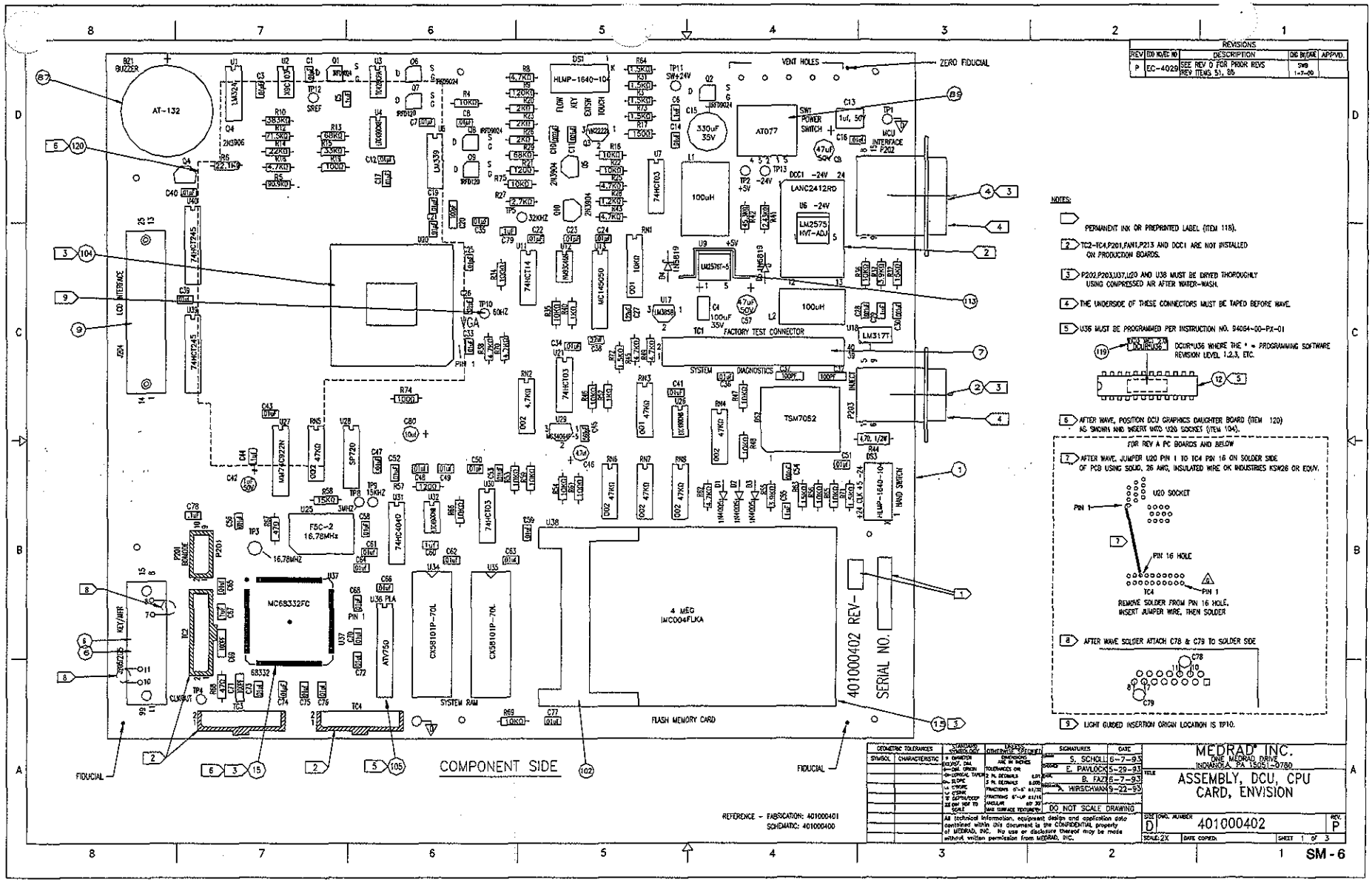
MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA PA 15051-0780

TITLE
SCHEMATIC, CONTROLLER CARD
D.C.U., MCT2.0

SIZE	DRAWING NUMBER	REV
D	401000400	E

SCALE NTS | DATE COPIED | SHEET 4 OF 4

SM-5



NOTES:

1. PERMANENT INK OR PREPRINTED LABEL (ITEM 118).
2. TC2-TC4,P201,FAN1,P213 AND DCC1 ARE NOT INSTALLED ON PRODUCTION BOARDS.
3. P202,P203,U37,U20 AND U38 MUST BE DRYED THOROUGHLY USING COMPRESSED AIR AFTER WATER-WASH.
4. THE UNDERSIDE OF THESE CONNECTORS MUST BE TAPED BEFORE WAVE.
5. U36 MUST BE PROGRAMMED PER INSTRUCTION NO. 94054-00-PX-01
   (119) 27C256 REV. 2.1H DOUBLEU36 — DOUBLEU36 WHERE THE * = PROGRAMMING SOFTWARE REVISION LEVEL 1,2,3, ETC.
6. AFTER WAVE, POSITION DCU GRAPHICS DAUGHTER BOARD (ITEM 120) AS SHOWN AND INSERT INTO U20 SOCKET (ITEM 104).

FOR REV A PC BOARDS AND BELOW

7. AFTER WAVE, JUMPER U20 PIN 1 TO TC4 PIN 16 ON SOLDER SIDE OF PCB USING SOLID, 26 AWG, INSULATED WIRE OR INDUSTRIES KSW26 OR EQUV.
   U20 SOCKET, PIN 1, PIN 16 HOLE, TC4, PIN 1
   REMOVE SOLDER FROM PIN 16 HOLE. INSERT JUMPER WIRE, THEN SOLDER
8. AFTER WAVE SOLDER ATTACH C78 & C79 TO SOLDER SIDE
9. LIGHT GUIDED INSERTION ORIGIN LOCATION IS TP10.

REVISIONS			
REV	ECO NO/EC NO	DESCRIPTION	DIR BY/DATE / APP'VD
P	EC-4029	SEE REV 'O' FOR PRIOR REVS. REV ITEMS 51, 86	SWB 1-7-00

SIGNATURES		DATE
DRAWN	S. SCHOLL	6-7-93
ENGR	E. PAVLOCK	5-29-93
QUALITY	S. FAZ	6-7-93
MFG	A. WIRSCHMAN	5-22-93

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UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES; TOLERANCES ON 2 PL DECIMALS ±.01, 3 PL DECIMALS ±.005, FRACTIONS ±1/64, ANGULAR ±0 30'; MAX SURFACE ROUGHNESS 125

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INDIANOLA, PA 15051-0780

TITLE: ASSEMBLY, DCU, CPU CARD, ENVISION

SIZE D | DWG. NUMBER 401000402 | REV. P | SCALE: 2X | DATE COPIED: | SHEET 1 OF 3

BILL OF MATERIAL

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
1	PC CARD,	401000401	1			
2	CONN., 9P, FILT., D-SUB, RA, AMP #1-842900-0	519-6702-045	1	P203	BW	
3						
4	CONN., 15P, FILT., D-SUB, RA, AMP #1-842901-0	519-6712-050	1	P202	BW	
5						
6	CONN., 15P, FILT., D-SUB, STR., AMP #1-842916-4	519-6713-055	1	J205	BW	
7	TEST CONNECTOR, 40P, AMP #103309-8	518-1033-098	1	TC1	BW	
8						
9	CONN., 25P, FILT., D-SUB, STR., AMP #1-842917-4	519-6723-088	1	J204	BW	
10						
11	IC, RAM, STATIC, CXK581001P-70L	070-5810-000	2	U34,35	LG	
12	IC, PROG. LOGIC DEVICE, ATV750	071-7502-000	1	U36	AW	
13	IC, HEX INVERTER, CMOS, 74HCT14N	074-74HT-014	1	U11	DIP	
14	IC, DIFF., DRV/RCV PR, LTC490CN8	054-4900-800	3	U4,26,32	DIP	
15	IC, PROCESSOR, 68332	070-6833-200	1	U37		
16	IC, 12-STAGE BINARY COUNTER, 74HC4040	004-4040-031	1	U31	DIP	
17	IC, A/D, 10BIT, MC145050 MOT	051-1450-050	1	U13	DIP	
18	IC, DRIVER, 74HCT245	074-74HT-245	2	U39,40	DIP	
19	IC, 16-KEY ENCODER, C-MOS MM74C922N	008-7400-922	1	U27	DIP	
20	IC, LIN QUAD OP AMP, LM324	050-0324-050	1	U1	DIP	
21	IC, ESD/OVERVOLT PROT. ARRAY, SP720	049-0720-000	1	U28	DIP	
22	IC, QUAD VOLTAGE COMPARATOR, LM339	052-0339-050	1	U5	DIP	
23	IC, EEPROM, 1K, SER., NM93C46N	071-9346-000	1	U12	DIP	
24						
25						
26	IC, DUAL, HI-SPD, PWR, MSFET, DRV TC428	072-0428-000	1	U3	DIP	
27	IC, QUAD 2-IN NAND, 74HCT03	074-74HT-003	3	U7,21,30	DIP	
28	IC, UNDER VOLT DET., MC34064P-5	049-3406-450	1	U29	BW	
29	IC, EEPOT, DIG. CON. POT, C-MOS, X9C103	009-9103-000	1	U2	DIP	
30	IC, VOLT REG., POS. ADJ., LM317T	052-0317-000	1	U18	BW	
31	DIODE, ZEN., 1.2V REF, LM385B	3001712	1	U17	BW	
32	CAP, CERAMIC, .01µF, 50V	201-0103-050	46	C1,3,7-9,12,14,16,17,19,21-26,33-36,39	LG	
				40,41,43,47-53,58,59,61-66,68,70,72-77		
33	CAP, CERAMIC, 100PF, 1KV	201-0101-000	5	20,32,37,69,71	LG	
34	CAP, ELECTROLYTIC, 330µF, 35V	204-0337-350	1	C15	LG	
35	CAP, ELECTROLYTIC, 1µF, 50V	204-0105-150	1	C42	LG	

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
36	FET, PWR, N-CH, 60V, TO-92, VN2222L	019-2222-000	1	Q3	BW	
37	CAP, 22µF, 35V	206-0226-350	1	C4	LG	
38	CAP, STACK FILM, 1µF, 50V	214-0105-050	1	C13	LG	
39	CAP, CERAMIC, .22µF, 50V	201-0224-050	2	C27,38	LG	
40	CAP, ELECTROLYTIC, 47µF, 50V	204-0476-050	2	C9,57	LG	
41	CAP, CERAMIC, 560pF, 50V	201-0561-050	1	C45	LG	
42	CAP, CERAMIC, .001µF, 50V	201-0102-050	5	C11,28,30,54,56	LG	
43	CAP, CERAMIC, .1µF, 50V	201-0104-050	9	C5,6,29,44,55,60,67,78,79	LG	
44	CAP, CERAMIC, .0022µF, 100V	201-0222-999	1	C10	LG	
45	RESISTOR, 4.7KΩ, 1/4W, 5%	303-0472-000	9	R8,18,25,38,43,45,49,62,70	AXI	
46	RESISTOR, 10KΩ, 1/4W, 5%	303-0103-000	16	R1,16,22,35,36,46-48,51,54,56,59,65,66,69,75	AXI	
47	CAP, ELECTROLYTIC, 4.7µF, 25V	204-0475-125	1	C46	LG	
48	RESISTOR, 22KΩ, 1/4W, 5%	303-0223-000	1	R14	AXI	
49	RESISTOR, 15KΩ, 1/4W, 1%	313-1502-000	3	R32,58,63	AXI	
50	RESISTOR, 1KΩ, 1/4W, 5%	303-0102-000	2	R40,52	AXI	
51	RESISTOR, 22.1KΩ, 1/4W, 1%	313-2212-000	1	R6	AXI	
52	RESISTOR, 120Ω, 1/4W, 5%	303-0121-000	2	R21,57	AXI	
53						
54	RESISTOR, 47Ω, 1/4W, 5%	303-0470-000	2	R67,68	AXI	
55						
56	RESISTOR, 68KΩ, 1/4W, 5%	303-0683-000	2	R13,29	AXI	
57	RESISTOR, 2.43KΩ, 1/4W, 1%	313-2431-000	1	R41	AXI	
58	RESISTOR, 2.7KΩ, 1/4W, 5%	303-0272-000	1	R27	AXI	
59	RESISTOR, 120KΩ, 1/4W, 5%	303-0124-000	1	R9	AXI	
60	RESISTOR, 150Ω, 1/4W, 5%	303-0151-000	1	R17	AXI	
61	RESISTOR, 1.2KΩ, 1/4W, 5%	303-0122-000	1	R28	AXI	

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SIGNATURES		DATE
DRAWN	S. SCHOLL	6-7-93
CHECKED	E. PAVLOCK	5-29-93
ENGR.	B. FAZI	6-7-93
PROJ. MGR.	A. HIRSCHMAN	9-22-93

SEE SHT. 1 FOR REV. LEVEL

MEDRAD® INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE

ASSEMBLY, DCU, CPU CARD, ENVISION

DWG. NUMBER 401000402 REV. P

DATE COPIED

SHEET 2 OF 3

BILL OF MATERIAL

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
62	RESISTOR, 3.9KΩ, 1/4W, 5%	303-0392-000	2	R37,55	AXI	
63	RESISTOR, 4.7Ω, 1/2W, 5%	305-0047-000	1	R44	LG	
64	RESISTOR, 1.5KΩ, 1/4W, 5%	303-0152-000	6	R3,31,64,71-73	AXI	
65	RESISTOR, 2KΩ, 1/4W, 5%	303-0202-000	3	R20,23,26	AXI	
66	RES. NET., 14P DIP, 47KΩ, 4114R-002-473	340-4114-473	5	RN4-8	AW, HC	
67	RESISTOR, 33KΩ, 1/4W, 5%	303-0333-000	1	R15	AXI	
68						
69	RES. NET., 14P DIP, 47KΩ, 4114R-001-473	341-4114-473	1	RN3	AW, HC	
70						
71	RES. NET., 16P DIP, 10KΩ, 4116R-001-103	341-4116-103	1	RN1	AW, HC	
72						
73	RES. NET., 14P DIP, 4.7KΩ, 4114R-002-472	340-4114-472	1	RN2	AW, HC	
74	DIODE, RECTIFIER, 1A, 600V, 1N4005	106-4005-000	3	D1-3	LG	
75						
76						
77						
78	IC, -24V REGULATOR, LM2575HVT-ADJ	051-2575-000	1	U6	BW	
79						
80	INTERGRATED DISPLAY, 14 SEG., TSM7052	484-7052-014	1	DS2	LG	
81	LED BAR ,8P, STRIP, ISO	485-1790-104	2	DS1,3	BW	
82	TRANSISTOR, NPN, 2N3904	120-3904-000	2	Q5,10	BW	
83	TRANSISTOR, PNP, 2N3906	121-3906-000	1	Q4	BW	
84						
85	FET, PWR, P-CH, 1W, 4P DIP, IRFD9024	019-9024-000	4	Q1,2,6,8	LG	
86	FET, PWR, N-CH, 4P DIP, IRFD120	019-0120-100	2	Q7,9	BW	
87	TRANSDUCER, AT-132	499-0132-000	1	BZ1	AW,HC	
88						
89	POWER SWITCH SOCKET	451-0077-000	1	SW1	BW	
90	CAP, ELECTROLYTIC, 10uF, 35V	204-0106-135	1	C80	LG	
91						
92						
93	IC, OSC, 16.78MHZ, FSC-2 16.780	012-1678-000	1	U25	LG	
94						
95						
96						
97						
98						
99	TEST POINT, PUSH-IN TYPE	642-1238-000	1	TP1	BW	
100						
101						
102	SOCKET,68 PIN,MEMORY CARD	518-5356-531	1	SOCKET FOR U38	BW	
103						
104	SOCKET,160 PIN	544-1160-160	1	SOCKET FOR U20	BW	
105	SOCKET, IC, 24P DIP, ICA-324-STT	545-0324-024	1	SOCKET FOR U36	LG	
106						
107						
108	DIODE, 1N5819	106-5819-000	2	D4,5	LG	
109	RESISTOR, 71.5K, 1/4W, 1%	313-7152-000	1	R12	AXI	
110	RESISTOR, 45.3K, 1/4W, 1%	313-4532-000	1	R42	AXI	
111	TOROID, 100ΩH, RL-4435-100-2.5	213-1004-000	2	L1,2	BW	
112	IC, +5V REGULATOR, LM2576T-5	052-2576-005	1	U9	BW	
113	HEATSINK, THERMOLLOY	600-7137-220	1		BW	
114	RESISTOR, 90.9KΩ, 1/4W, 1%	313-9092-000	1	R5	AXI	
115						
116	RESISTOR, 383KΩ, 1/4W, 1%	313-3833-000	1	R10	AXI	
117	RESISTOR, 100Ω, 1/4W, 5%	303-0101-000	4	R19,34,61,74	AXI	
118	LABEL,BLANK SERIAL NUMBER	550-4426-100	1		BW	NOTE 1
119	LABEL, BLANK, PAL	550-0017-619	1		AW	
120	DCU GRAPHICS DAUGHTER BOARD	401002274	1		AW	

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SIGNATURES		DATE
DRAWN	S. SCHOLL	6/7/93
CHECKED	E. PAVLOCK	5/29/93
ENGR.	B. FAZI	6/7/93
PROJ. MGR.	A. HIRSCHMAN	9-22-93

SEE SHT. 1 FOR REV. LEVEL

MEDRAD® INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

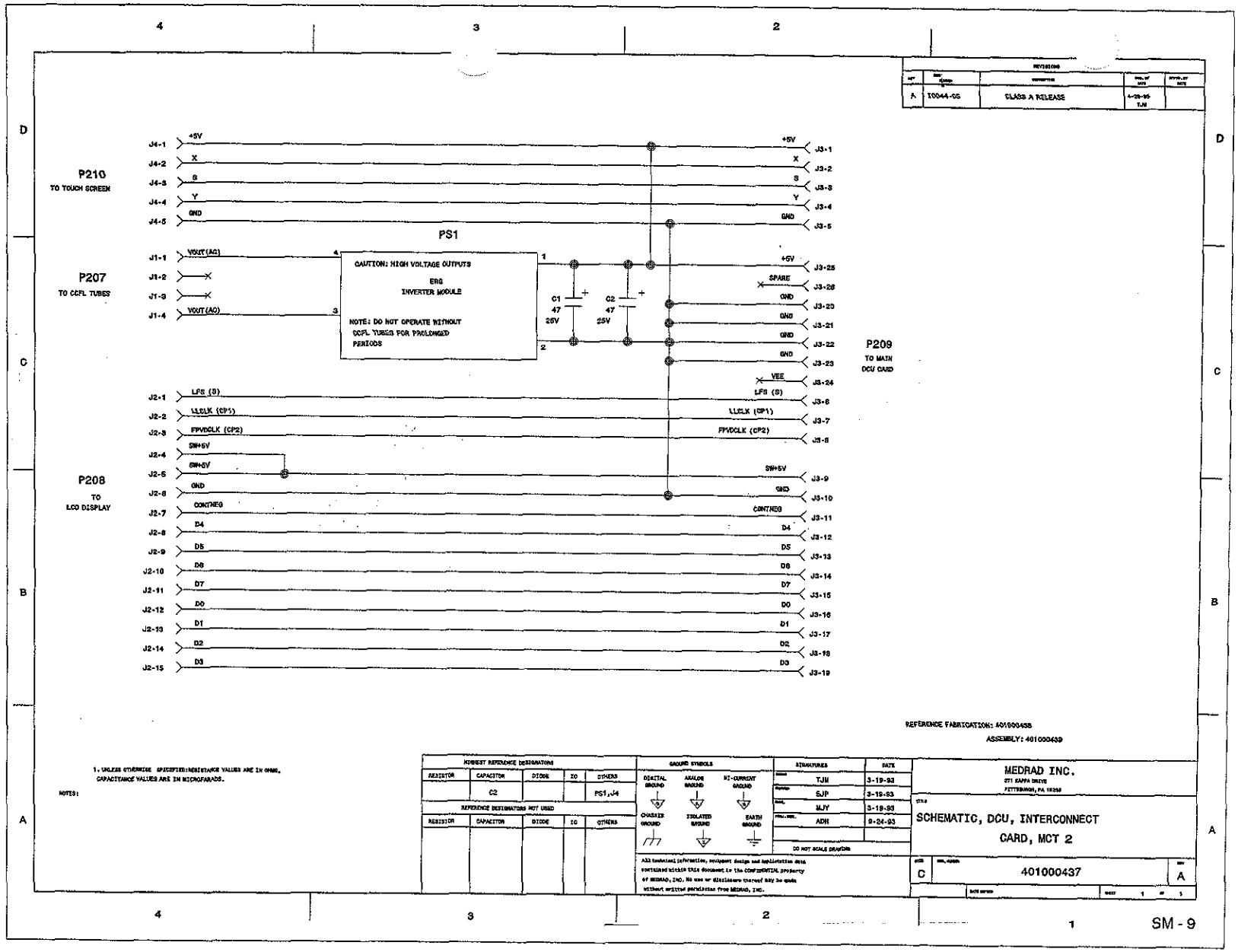
TITLE

ASSEMBLY, DCU, CPU CARD, ENVISION

DWG. NUMBER 401000402 REV. P

DATE COPIED

SHEET 3 OF 3


REVISIONS
A 10044-05 CLASS A RELEASE 4-28-95 TJM
P210
TO TOUCH SCREEN
J4-1 +5V
J4-2 X
J4-3 S
J4-4 Y
J4-5 GND
PS1
P207
TO CCFL TUBES
J1-1 VOUT(AC)
J1-2
J1-3
J1-4 VOUT(AC)
CAUTION: HIGH VOLTAGE OUTPUTS
ERG
INVERTER MODULE
NOTE: DO NOT OPERATE WITHOUT
CCFL TUBES FOR PROLONGED
PERIODS
C1 47 25V
C2 47 25V
P208
TO
LCD DISPLAY
J2-1 LFS (S)
J2-2 LLCLK (CP1)
J2-3 FPVDCLK (CP2)
J2-4 SW+5V
J2-5 SW+5V
J2-6 GND
J2-7 CONTNEG
J2-8 D4
J2-9 D5
J2-10 D6
J2-11 D7
J2-12 D0
J2-13 D1
J2-14 D2
J2-15 D3
P209
TO MAIN
DCU CARD
+5V J3-1
X J3-2
S J3-3
Y J3-4
GND J3-5
+5V J3-25
SPARE J3-26
GND J3-20
GND J3-21
GND J3-22
GND J3-23
VEE J3-24
LFS (S) J3-6
LLCLK (CP1) J3-7
FPVDCLK (CP2) J3-8
SW+5V J3-9
GND J3-10
CONTNEG J3-11
D4 J3-12
D5 J3-13
D6 J3-14
D7 J3-15
D0 J3-16
D1 J3-17
D2 J3-18
D3 J3-19
REFERENCE FABRICATION: 401000438
ASSEMBLY: 401000439
NOTES:
1. UNLESS OTHERWISE SPECIFIED:RESISTANCE VALUES ARE IN OHMS.
CAPACITANCE VALUES ARE IN MICROFARADS.
HIGHEST REFERENCE DESIGNATORS
RESISTOR CAPACITOR DIODE IC OTHERS
C2 PS1,J4
REFERENCE DESIGNATORS NOT USED
RESISTOR CAPACITOR DIODE IC OTHERS
GROUND SYMBOLS
DIGITAL GROUND
ANALOG GROUND
RF-CURRENT GROUND
CHASSIS GROUND
ISOLATED GROUND
EARTH GROUND
SIGNATURES DATE
DRAWN TJM 3-19-93
CHECKED SJP 3-19-93
ENGR. MJV 3-19-93
PROJ. ENGR. ADH 9-24-93
DO NOT SCALE DRAWING
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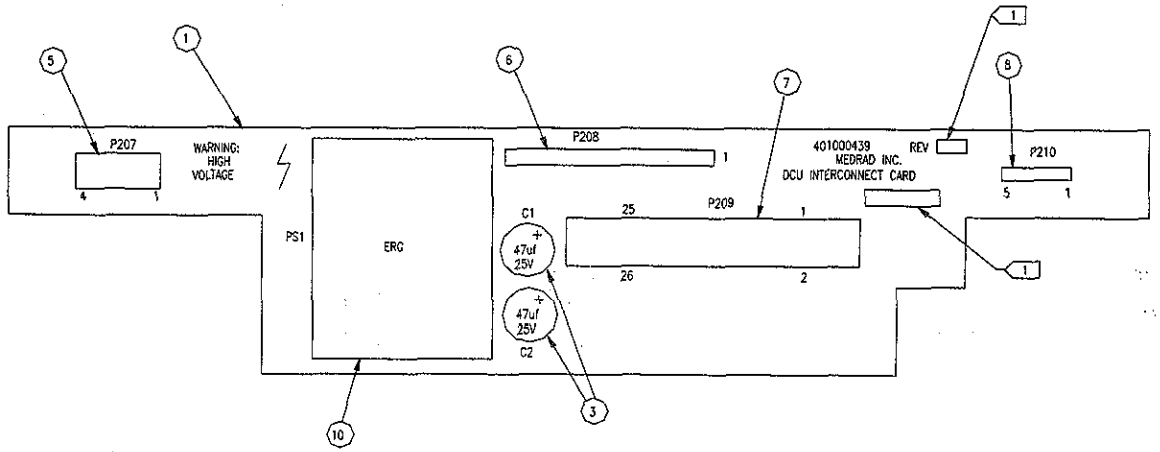
MEDRAD INC.
271 KAPPA DRIVE
PITTSBURGH, PA 15238
TITLE
SCHEMATIC, DCU, INTERCONNECT CARD, MCT 2
SIZE C
DWG. NUMBER 401000437
REV A
SHEET 1 OF 1
SM-9

REVISIONS				
REV	ECO/ERO NO	DESCRIPTION	CHG BY/DATE	APPVD.
D	EC-3971	CAD REGENERATED SEE REV C FOR PRIOR REVS, ADDED BAR CODE	SWB 11-22-99	



REFERENCE FABRICATION: 401000438
SCHEMATIC: 401000437

NOTES:

1. SERIAL NUMBER TO BE APPLIED USING PREPRINTED LABEL (ITEM 12) AND REVISION TO BE APPLIED USING PERMANENT INK IN AREA SHOWN.

GEOMETRIC TOLERANCES		STANDARD SYMBOLOGY	UNLESS OTHERWISE SPECIFIED	SIGNATURES	DATE
SYMBOL	CHARACTERISTIC	⌀ DIAMETER (R)REF. DIM. ←DIM. ORIGIN ⌲ CONICAL TAPER ⏥ SLOPE ⌴ C'BORE ⌵ C'SINK ↧ DEPTH/DEEP XX DIM. NOT TO SCALE	DIMENSIONS ARE IN INCHES TOLERANCES ARE 2 PL DECIMALS ±.01 3 PL DECIMALS ±.005 FRACTIONS 6"-6" ±1/32 FRACTIONS 6"-up ±1/16 ANGULAR ±0° 30' MAX SURFACE TEXTURE 125	DRAWN E. PAVLOCK CHECKED S. SCHOLL ENGR. M. YANNIELLO PROJECT D. KLODOWSKI	3-23-93 3-23-93 3-23-93 3-23-94
			DO NOT SCALE DRAWING		

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MEDRAD® INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE: ASSEMBLY, DCU INTERCONNECT CARD, ENVISION

SIZE	DWG. NUMBER	REV.
C	401000439	D

SCALE: 2X | DATE COPIED: | SHEET 1 OF 2

BILL OF MATERIAL

ITEM	DESCRIPTION	PART NUMBER	QTY	REF DESIG	LAND PATTERN	PACKAGE	PROCESS CODE	PREP CODE
1	PC BOARD	401000438	1					
2								
3	CAPACITOR, 47µF, 25V	204-0476-025	2	C1,2			BW	
4								
5	CONNECTOR, 4 POS	518-4160-140	1	P207			BW	
6	CONNECTOR, 15 POS	518-5301-415	1	P208			BW	
7	CONNECTOR, 26 POS	518-3429-226	1	P209			BW	
8	CONNECTOR, 5 POS	518-1051-400	1	P210			BW	
9								
10	INVERTER MODULE, ERG E1467	040-1467-005	1	PS1			BW	
11								
12	LABEL, BLANK SERIAL NO.	550-4426-100	1					< 1

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SIGNATURES		DATE
DRAWN	E. PAVLOCK	3-23-93
CHECKED	S. SCHOLL	3-23-93
ENGR.	B. FAZI	3-23-93
PROJ.MGR.	D. KLODOWSKI	3-23-94

SEE SHT. 1 FOR REV. INFO.

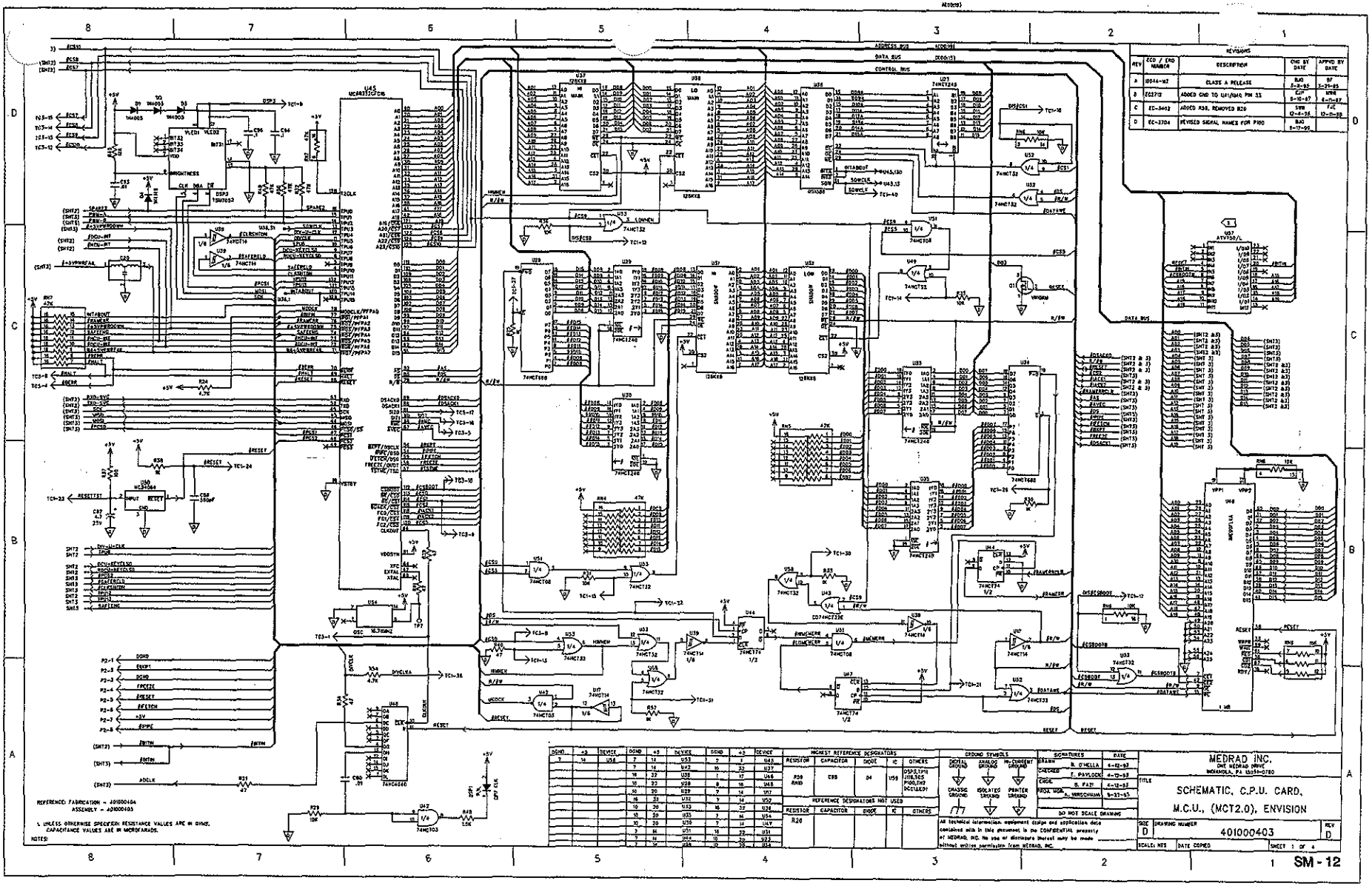
MEDRAD® INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE: ASSEMBLY, DCU INTERCONNECT CARD, ENVISION

DWG. NUMBER: 401000439

REV.: D

DATE COPIED:



REVISIONS				
REV	ECO / ERO NUMBER	DESCRIPTION	CHK BY DATE	APPRD BY DATE
A	10044-MZ	CLASS A RELEASE	RJG 8-8-89	BF 8-29-89
B	EC0270	ADDED GND TO U41(MAG PIN 33	CJP 8-16-87	MWE 4-11-87
C	EC-3402	ADDED R38, REMOVED R26	SMW 12-4-96	TJC 12-11-96
D	EC-3704	REVISED SIGNAL NAMES FOR P100	RJG 8-17-95	

DGND	+5	DEVICE	DGND	+5	DEVICE	DGND	+5	DEVICE
7	14	U58	7	14	U53	1	8	U45
			8	16	U42	10	32	U37
			7	14	U41	1	16	U38
			16	32	U38	9	17	U46
			10	20	U39	7	14	U47
			16	32	U32	7	14	U50
			10	20	U33	10	32	U34
			10	20	U35	7	14	U49
			7	14	U51	10	32	U31
			7	14	U44	10	32	U33
			8	16	U43	10	32	U54

HIGHEST REFERENCE DESIGNATORS				
RESISTOR	CAPACITOR	DIODE	IC	OTHERS
R29 AND	C95	D4	U59	DSP2,TP11 J100,SO5 P100,TP6 OCCUPIED!

REFERENCE DESIGNATORS NOT USED				
RESISTOR	CAPACITOR	DIODE	IC	OTHERS
R26				

GROUND SYMBOLS: DIGITAL GROUND; ANALOG GROUND; HI-CURRENT GROUND; CHASSIS GROUND; ISOLATED GROUND; PRINTER GROUND

DO NOT SCALE DRAWING

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SIGNATURES	DATE
DRAWN B. O'NEILL	4-12-93
CHECKED F. PAYLOCK	4-12-93
ENGR. S. FAZI	4-12-93
PROJ. MGR. A. VERCHIMAK	5-27-93

MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

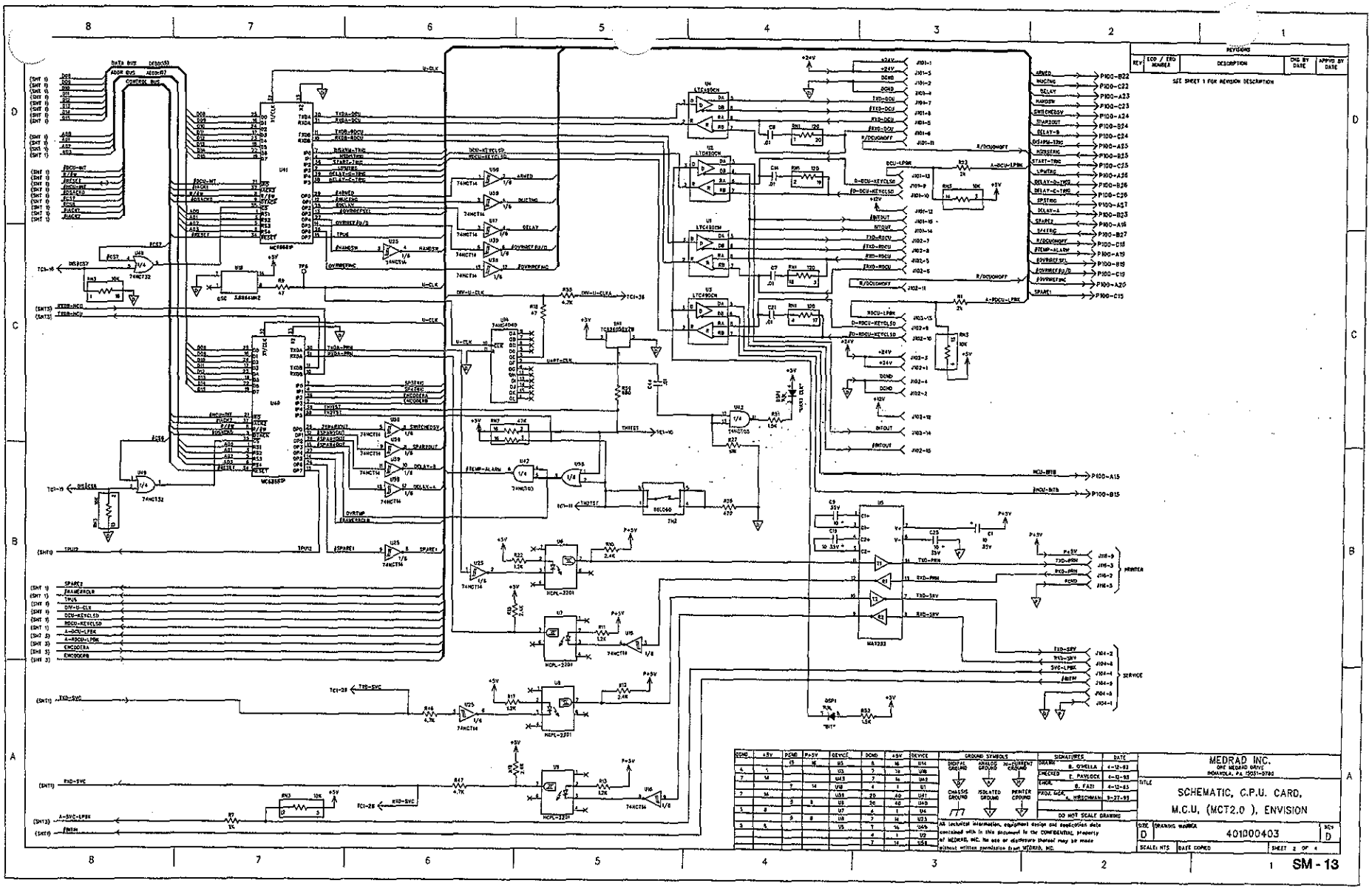
TITLE: SCHEMATIC, C.P.U. CARD, M.C.U., (MCT2.0), ENVISION

SIZE D | DRAWING NUMBER 401000403 | REV D

SCALE: NTS | DATE COMPLETED | SHEET 1 OF 4

REFERENCE FABRICATION = 401000404
ASSEMBLY = 401000403

NOTES:
1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS.


REVISIONS
REV
ECO / ECO NUMBER
DESCRIPTION
CHG BY DATE
APPVD BY DATE
SEE SHEET 1 FOR REVISION DESCRIPTION
MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780
TITLE
SCHEMATIC, C.P.U. CARD,
M.C.U, (MCT2.0), ENVISION
SIZE
D
DRAWING NUMBER
401000403
REV
D
SCALE: NTS
DATE COPIED
SHEET 2 OF 4
DRAWN
B. O'NEILL
4-12-93
CHECKED
E. PAVLOCK
4-12-93
ENGR.
B. FAZI
4-12-93
PROJ. MGR.
L. WEICHMAN
9-27-93
DO NOT SCALE DRAWING
GROUND SYMBOLS
DIGITAL GROUND
ANALOG GROUND
RF-CURRENT GROUND
CHASSIS GROUND
ISOLATED GROUND
PRINTER GROUND
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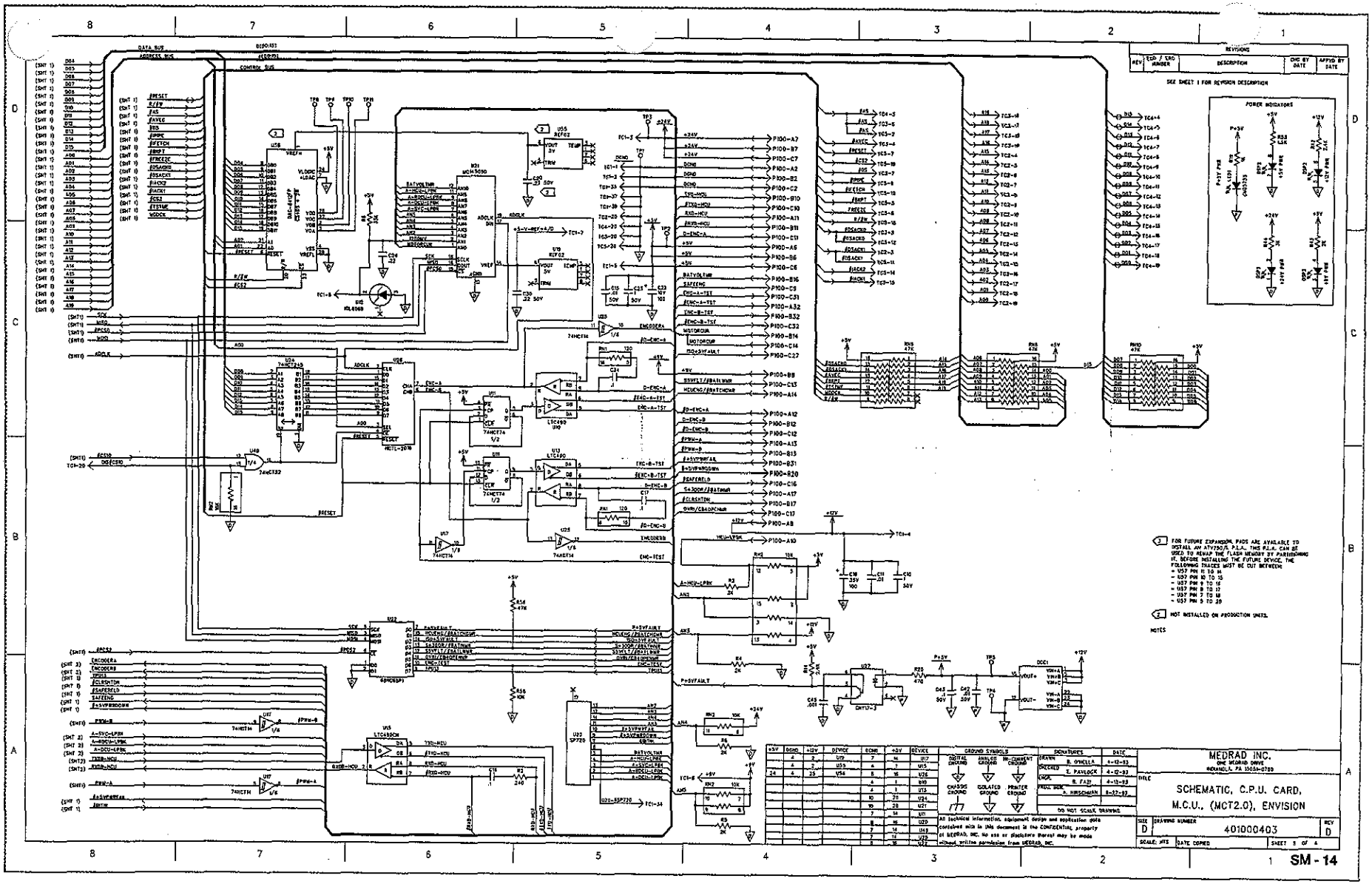
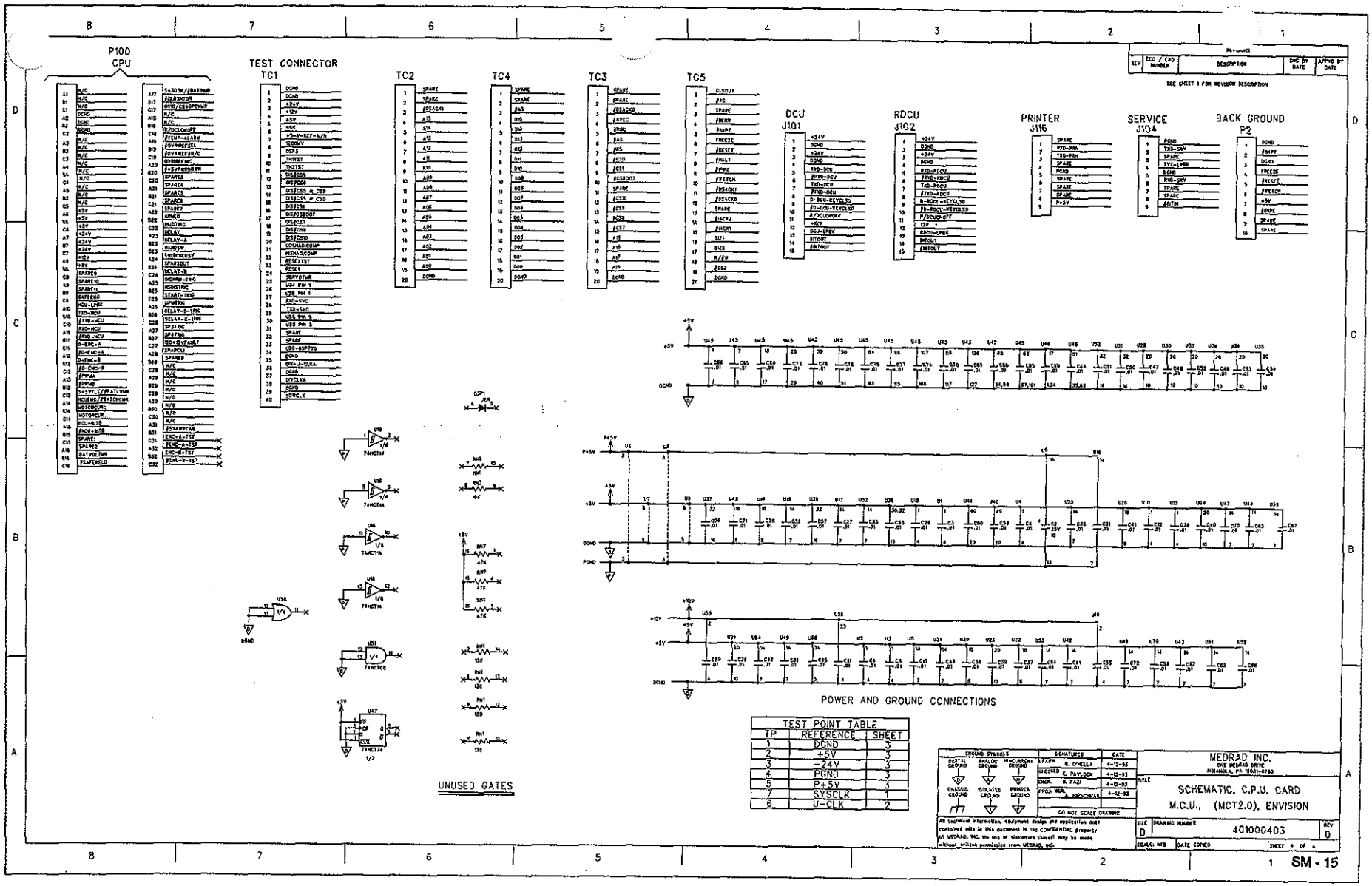
PRINTER
SERVICE
MAX232
SM - 13


REVISIONS
REV
ECO / ENG NUMBER
DESCRIPTION
CHG BY DATE
APPRD BY DATE
SEE SHEET 1 FOR REVISION DESCRIPTION
POWER INDICATORS
NOTES
MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780
SCHEMATIC, C.P.U. CARD, M.C.U., (MCT2.0), ENVISION
401000403
SIZE D
REV D
SCALE: NTS
SHEET 3 OF 4
SM - 14



TEST POINT TABLE		
TP	REFERENCE	SHEET
1	DGND	3
2	+5V	3
3	+24V	3
4	PGND	3
5	P+5V	3
7	SYSCLK	1
6	U-CLK	2

REV	ECO / ENG NUMBER	DESCRIPTION	CHG BY DATE	APPVD BY DATE

SEE SHEET 1 FOR REVISION DESCRIPTION

GROUND SYMBOLS: DIGITAL GROUND; ANALOG GROUND; M-CURRENT GROUND; CHASSIS GROUND; ISOLATED GROUND; PROTECTIVE GROUND

SIGNATURES		DATE
DRAWN	R. D'ADELLA	4-12-93
CHECKED	E. PAYLOCK	4-12-93
ENGR	R. FAZI	4-12-93
PROJ. MGR.	L. HIRSCHMAN	4-12-93

DO NOT SCALE DRAWING

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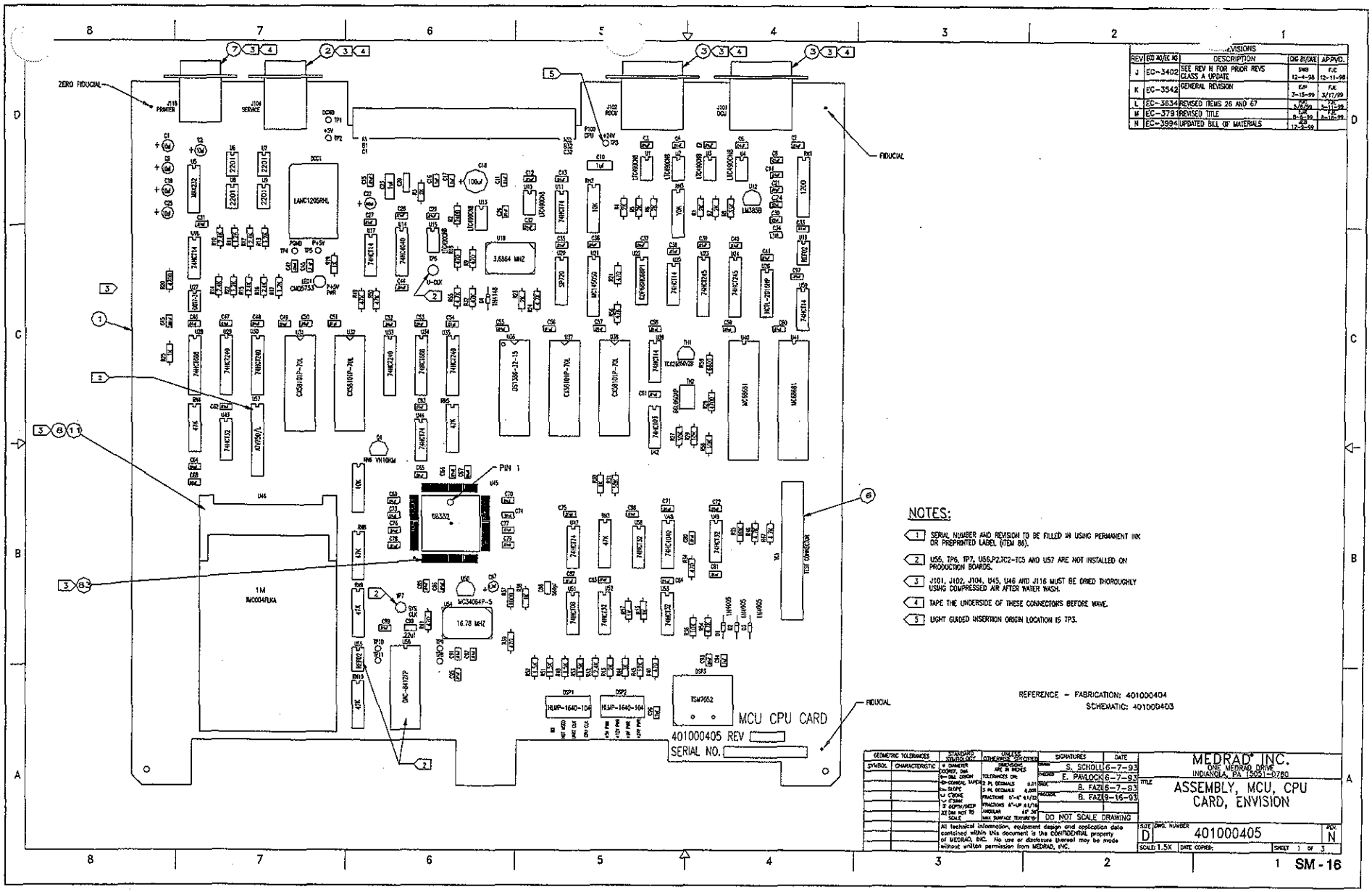
MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE: SCHEMATIC, C.P.U. CARD
M.C.U., (MCT2.0), ENVISION

SIZE D | DRAWING NUMBER 401000403 | REV D

SCALE: NTS | DATE COPIED | SHEET 4 OF 4



REVISIONS				
REV	ECO NO/EC NO	DESCRIPTION	DR BY/DATE	APP'VD.
J	EC-3402	SEE REV H FOR PRIOR REVS CLASS A UPDATE	SWB 12-4-98	PJE 12-11-98
K	EC-3542	GENERAL REVISION	BJP 3-15-99	PJE 3/17/99
L	EC-3634	REVISED ITEMS 26 AND 67	BJP 5/7/99	PJE 5-11-99
M	EC-3791	REVISED TITLE	BJP 8-3-99	PJE 8-16-99
N	EC-3994	UPDATED BILL OF MATERIALS	BJP 12-3-99	

NOTES:

1. SERIAL NUMBER AND REVISION TO BE FILLED IN USING PERMANENT INK OR PREPRINTED LABEL (ITEM 86).
2. U55, TP6, TP7, U56,P2,TC2-TC5 AND U57 ARE NOT INSTALLED ON PRODUCTION BOARDS.
3. J101, J102, J104, U45, U46 AND J116 MUST BE DRIED THOROUGHLY USING COMPRESSED AIR AFTER WATER WASH.
4. TAPE THE UNDERSIDE OF THESE CONNECTORS BEFORE WAVE.
5. LIGHT GUIDED INSERTION ORIGIN LOCATION IS TP3.

REFERENCE – FABRICATION: 401000404
SCHEMATIC: 401000403

GEOMETRIC TOLERANCES		STANDARD SYMBOLOGY	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	SIGNATURES	DATE
SYMBOL	CHARACTERISTIC	Ø = DIAMETER SQ = SQUARE R = RADIUS SR = SPHERICAL RADIUS ⌒ = ARC ∠ = SLOPE C = CHORD ⌓ = CENTER ⌖ = DEPTH/SPOT XX DIM NOT TO SCALE	TOLERANCES ON: 2 PL DECIMALS ±.01 3 PL DECIMALS ±.005 FRACTIONS 0"-6" ±1/32 FRACTIONS 6"-UP ±1/16 ANGULAR ±2° 30' MAX SURFACE ROUGHNESS	DRAWN: S. SCHOLL 6-7-93 ENGR: E. PAVLOCK 6-7-93 QUAL: B. FAZI 6-7-93 PROGR: B. FAZI 9-16-93 DO NOT SCALE DRAWING	

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MEDRAD® INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE: ASSEMBLY, MCU, CPU CARD, ENVISION

SIZE: D | DWG. NUMBER: 401000405 | REV: N

SCALE: 1.5X | DATE COPIED: | SHEET 1 OF 3

BILL OF MATERIAL

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
1	PC CARD	401000404	1			
2	CONNECTOR, 9P, D-SUB, FILT., R/A, FEM.	519-6704-046	1	J104	BW	
3	CONNECTOR, 15P, D-SUB, FILT., R/A, FEM.	519-6714-039	2	J101-102	BW	
4	CONNECTOR, EURO, 96 PIN, RIGHT ANGLE	518-5364-055	1	P100	BW	
5						
6	CONNECTOR, 40 PIN, DOUBLE ROW	518-1033-098	1	TC1	BW	
7	CONNECTOR, 9P, D-SUB, CAP., FILT., R/A, FEM.	519-6704-045	1	J116	BW	
8	SOCKET, 68 PIN, MEMORY CARD	518-5356-531	1		BW	
9						
10	IC, RAM, STATIC, CX58101P-70L	070-5810-000	4	U31,32,37,38	LG	
11						
12	IC, QUAD 2-IN NAND, 74HCT03	074-74HT-003	1	U42	DIP	
13	IC, OSC, 16.78 MHZ, F5616.78	012-1678-000	1	U54	LG	
14	IC, 74HC4040	004-4040-031	2	U14,48	DIP	
15	IC, HEX INV, SCH TRG, 74HCT14	074-74HT-014	5	U16,17,25,39,59	DIP	
16	IC, QUAD OR, 2 INPUT, 74HCT32	074-74HT-032	5	U43,49,52,53,58	DIP	
17	IC, RAM TIMEKEEPER, DS1386-32-15	070-1386-321	1	U36	LG	
18	IC, DIFF, DRV/RCV PR, LTC490CN8	054-4900-800	7	U1-4,10,13,15	DIP	
19	IC, DUART, MC68681 MOT	051-6868-100	2	U40,41	LG	
20	IC, MAX232	051-0232-000	1	U5	DIP	
21	IC, CNY17-3	097-0173-000	1	U27	DIP	
22	IC, QUAD DEC/CNTR, HCTL-2016HP	008-2016-000	1	U26	DIP	
23	IC, UNDER VOLT SENSE, MC34064P-5	049-3406-450	1	U50	BW	
24	IC, OCT BUF/LN DRV, INV, 74HCT240	074-74HT-240	4	U29,30,33,35	DIP	
25	IC, REF +5V, REF02 MAX	052-4102-005	1	U19	DIP	
26	IC, LM385B, 1.2VREF	3001712	1	U12	BW	
27	IC, D-FLIP-FLOP, 74HCT74	074-74HT-074	3	U11,44,47	DIP	
28	IC, ESD/OVER VOLT PROT, SP720	049-0720-000	1	U20	DIP	
29	IC, SINGLE PORT I/O, CDP68HC68P1 HAR	070-6868-000	1	U22	DIP	
30	IC, 74HCT08	074-74HT-008	1	U51	DIP	
31	IC, A/D, 10 BIT, MC145050 MOT	051-1450-050	1	U21	DIP	
32	IC, OSC, 3.6864 F5C 3.6864	012-3686-400	1	U18	LG	
33	IC, 74HCT245	074-74HT-245	2	U23,24	DIP	
34	IC,74HCT688	074-74HT-688	2	U28,34	DIP	
35	CAPACITOR, .01µF, 50V	201-0103-050	76	C3-8,11-15,21,26-29,31-33, 35-42,44,46-86,89,91-93,95,97,98	LG	

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
36	CAPACITOR, 560PF, 50V	201-0561-050	1	C88	LG	
37	CAPACITOR, .22uF, 50V	201-0224-050	3	C24,30,90	LG	
38	CAPACITOR, .1uF, 50V	201-0104-050	6	C16,17,34,43,94,96	LG	
39	CAPACITOR, 100uF, 35V	204-0107-350	1	C18	LG	
40	CAPACITOR, 10uF, 35V	204-0106-135	5	C1,2,9,19,25	LG	
41	CAPACITOR, .001uf	201-0102-050	1	C45	LG	
42	CAPACITOR, 1uF, 50V	214-0105-050	2	C10,23	LG	
43	CAPACITOR, 100uF, 10V	204-0107-010	1	C22	LG	
44	FILTER, EMI, DSS306-5S-FZ103N100, M.E.	199-3064-103	1	C20	BW	
45	RESISTOR, 470Ω, 1/4W,5%	303-0471-000	3	R20,28	AXI	
46	RESISTOR, 12K, 1/4W,5%	303-0123-000	1	R45	AXI	
47	RESISTOR, 100Ω, 1/4W,5%	303-0101-000	1	R37	AXI	
48	RESISTOR, 1K, 1/4W,5%	303-0102-000	6	R19,25,30,33,38,57	AXI	
49	RESISTOR, 2K, 1/4W,5%	303-0202-000	8	R1,3-7,23,43	AXI	
50	CAPACITOR, 4.7uF, 25V	204-0475-125	1	C87	LG	
51	RESISTOR, 1.5K, 1/4W,5%	303-0152-000	4	R48,51-53	AXI	
52	RESISTOR, 1.2K, 1/4W, 5%	303-0122-000	4	R11,13,17,22	AXI	
53	RESISTOR, 470, 1/4W,5%	303-0470-000	7	R9,18,21,34,39-41	AXI	
54	RESISTOR, 240Ω, 1/4W,5%	303-0241-000	1	R2	AXI	
55	RESISTOR, 10K, 1/4W,5%	303-0103-000	6	R27,29,31,35,36,58	AXI	
56	RESISTOR, 2.4K,1/4W, 5%	303-0242-000	6	R10,12,14-16,42	AXI	
57	RESISTOR, 47K, 1/4W, 5%	303-0473-000	4	R32,49,50,56	AXI	
58	RESISTOR, 4.7K, 1/4W, 5%	303-0472-000	5	R24,46,47,54,55	AXI	
59	RESISTOR, 33K, 1/4W, 5%	303-0333-000	1	R8	AXI	
60	IC, OPTO, HCPL-2201	099-2201-000	4	U6-9	DIP	
61	RESISTOR, 680Ω, 1/4W, 5%	303-0681-000	1	R59	AXI	

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SIGNATURES		DATE
DRAWN	S. SCHOLL	5-9-93
CHECKED	E. PAVLOCK	5-29-93
ENGR.	B. FAZI	6-10-93
PROJ. MGR.	A. HIRSCHMAN	9-28-93

SEE SHT. 1 FOR REV. LEVEL

MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE

ASSEMBLY, MCU, CPU CARD, ENVISION

DWG. NUMBER 401000405 REV. N

DATE COPIED

SHEET 2 OF 3

BILL OF MATERIAL

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE	ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
62													
63	RESISTOR NETWORK,DIP 16,8 RES,10K	341-4116-103	3	RN2,3,6	AW, HC								
64	RESISTOR NETWORK, DIP 16,15 RES,47K	341-4116-473	6	RN4,5,7,8-10	AW, HC								
65	RESISTOR NETWORK,DIP 20,10 RES,120Ω	341-4120-121	1	RN1	AW, HC								
66	RESISTOR, 3K, 1/4W,5%	303-0302-000	1	R44	AXI								
67	DIODE,1N4148	105-4148-000	1	D4	AXI								
68	DIODE, 1N4005	106-4005-000	1	D1-3	LG								
69	DIODE,LED,RED,CMD5753	094-5733-000	1	LED1	LG								
70	FET, VN10KM	019-0010-000	1	Q1	BW								
71													
72													
73	DISPLAY,14 SEG, TSM7052	484-7052-014	1	DSP3	LP								
74	LED ARRAY,4,RT/A,GREEN,HLMP-1640-104	485-1790-104	2	DSP1-2	BW								
75													
76	THERMAL SWITCH,50 DEGREES,TC626050VZB	3001941	1	TH1	BW								
77	THERMOSTAT, 60 DEGREES, 66L060 AP	055-6660-000	1	TH2	LG								
78													
79	DC-DC CONVERTER, 12V, VOUT 5V/300ma, LANC1205RHL	041-1205-000	1	DCC1	DIP								
80													
81													
82													
83	IC , PROCESSOR, 68332,SURFACE MOUNT	070-6833-200	1	U45	SMT-M								
84													
85													
86	LABEL, BLANK SERIAL NUMBER	550-4426-100	1										

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SIGNATURES		DATE
DRAWN	S. SCHOLL	5-9-93
CHECKED	E. PAVLOCK	5-29-93
ENGR.	B. FAZI	6-10-93
PROJ. MGR.	A. HIRSCHMAN	9-28-93

SEE SHT. 1 FOR REV. LEVEL

MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

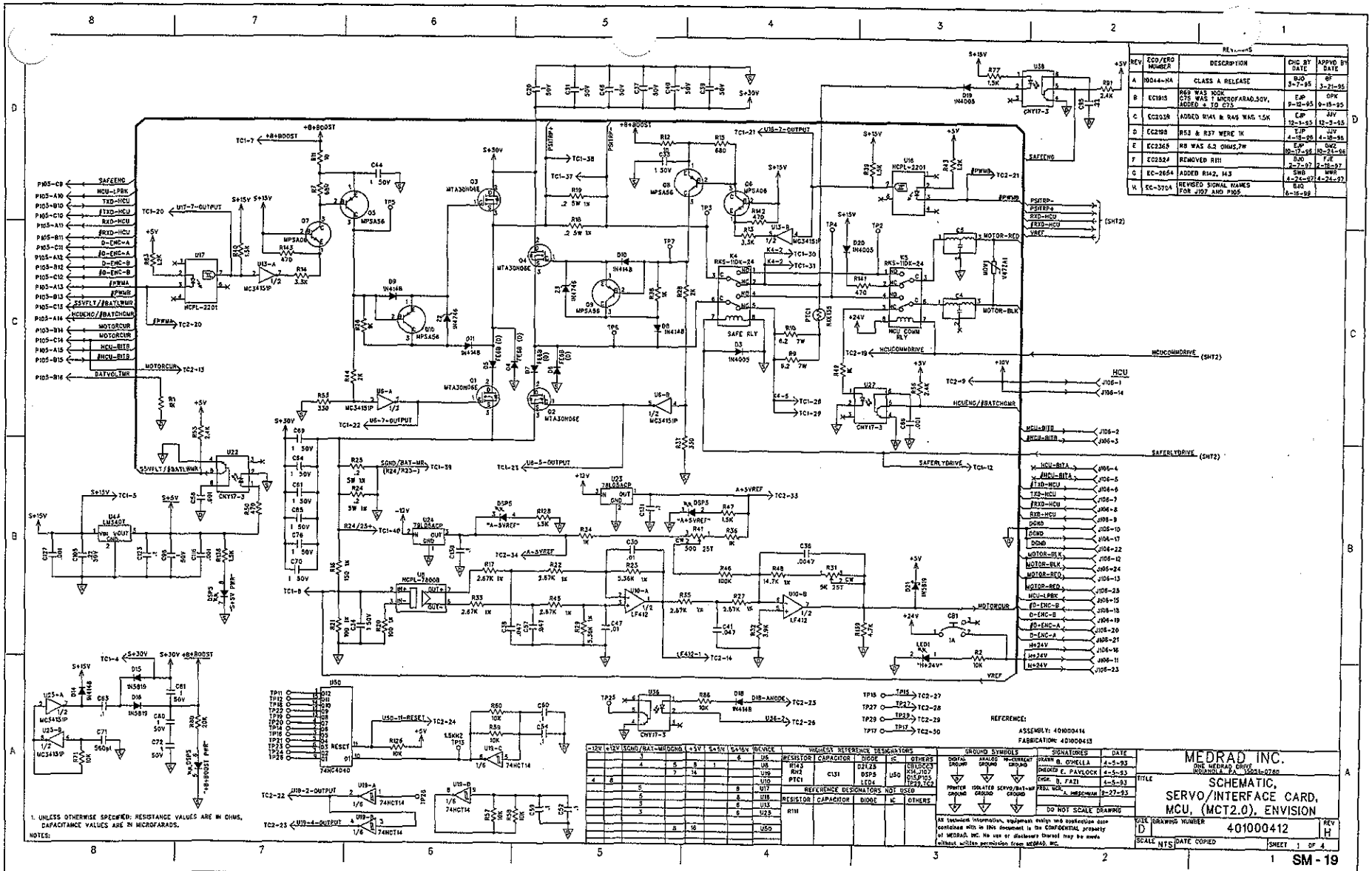
TITLE

ASSEMBLY, MCU, CPU CARD, ENVISION

DWG. NUMBER 401000405 REV. N

DATE COPIED

SHEET 3 OF 3



REV	ECO/ERO NUMBER	DESCRIPTION	CHG BY DATE	APPVD BY DATE
A	00044-HA	CLASS A RELEASE	BJO 3-7-95	GF 3-21-95
B	EC2815	R69 WAS 100K C75 WAS 1 MICROFARAD,30V, ADDED 4 TO C75	EJP 9-12-95	DPK 9-15-95
C	EC2038	ADDED R141 & R46 WAS 1.5K	EJP 12-1-95	JJV 12-5-95
D	EC2198	R53 & R37 WERE 1K	EJP 4-18-96	JJV 4-18-96
E	EC2365	R8 WAS 6.2 OHMS,7W	EJP 10-17-96	DMZ 10-24-96
F	EC2524	REMOVED R111	BJO 4-7-97	FJE 4-18-97
G	EC-2654	ADDED R142, 143	SWB 4-24-97	MMR 4-24-97
H	EC-5704	REVISED SIGNAL NAMES FOR J107 AND P105	BJO 6-16-98	

DRAWN	B. O'NEILLA	4-5-93
CHECKED	E. PAVLOCK	4-5-93
ENGR.	S. FAZI	4-5-93
PROJ. MGR.	A. HERSHMAN	9-27-93

DO NOT SCALE DRAWING

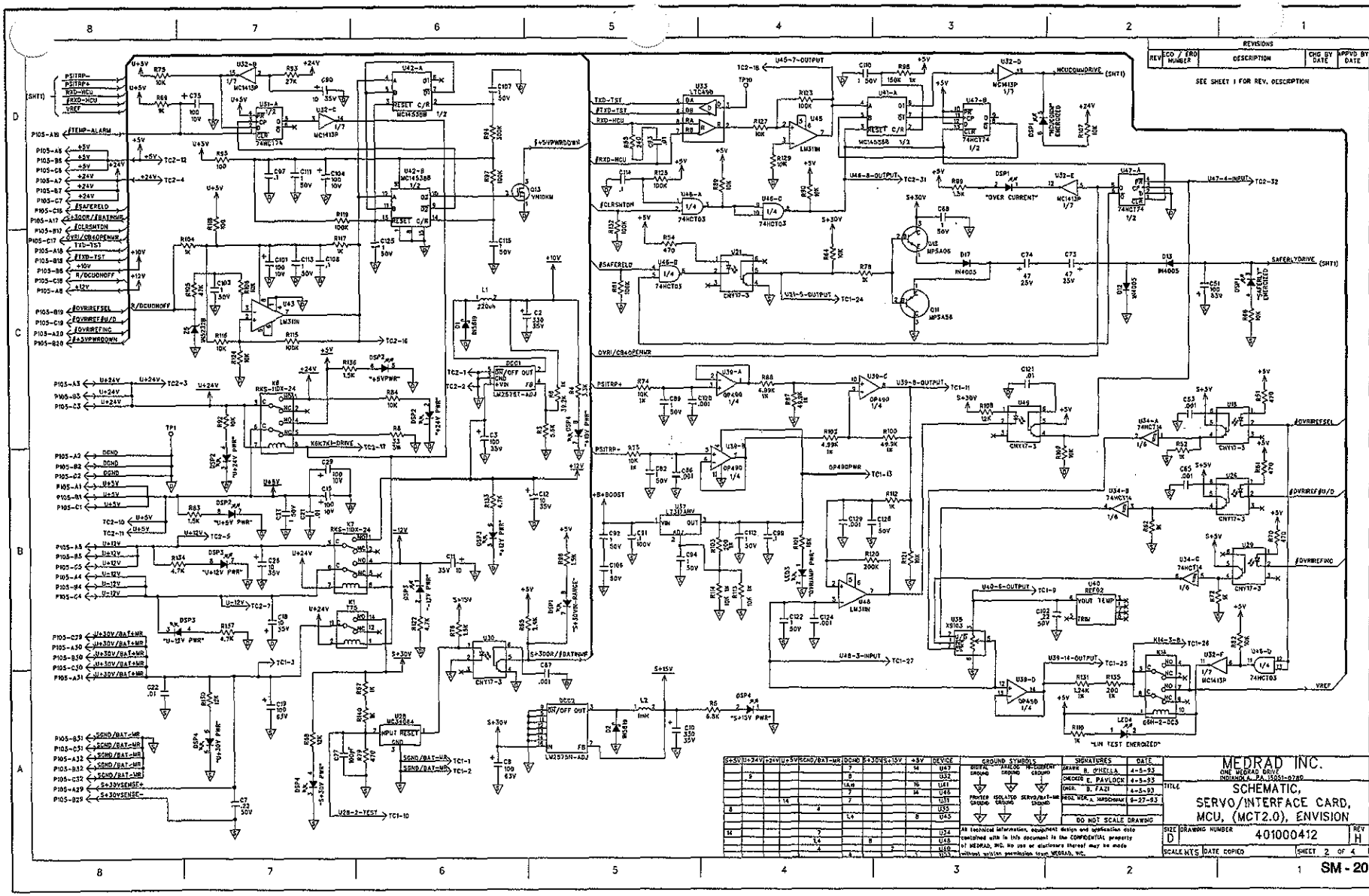
MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA, PA. 15051-0780

TITLE: SCHEMATIC, SERVO/INTERFACE CARD, MCU, (MCT2.0), ENVISION

SIZE: D | DRAWING NUMBER: 401000412 | REV: H

SCALE: NTS | DATE COPIED | SHEET 1 OF 4

SM - 19



REVISIONS				
REV	ECO / ERO NUMBER	DESCRIPTION	CHG BY DATE	APPVD BY DATE

SEE SHEET 1 FOR REV. DESCRIPTION

GROUND SYMBOLS	
DIGITAL GROUND	ANALOG GROUND
NON-SUBSCRIPT GROUND	
PROTECT GROUND	ISOLATED GROUND
SERVO/BAT-MR GROUND	

SIGNATURES	DATE
DRAWN R. O'NEILL	4-5-93
CHECKED E. PAVLOCK	4-5-93
ENGR. B. FAZI	4-5-93
PROJ. MGR. A. HARSHMAN	8-27-93
DO NOT SCALE DRAWING	

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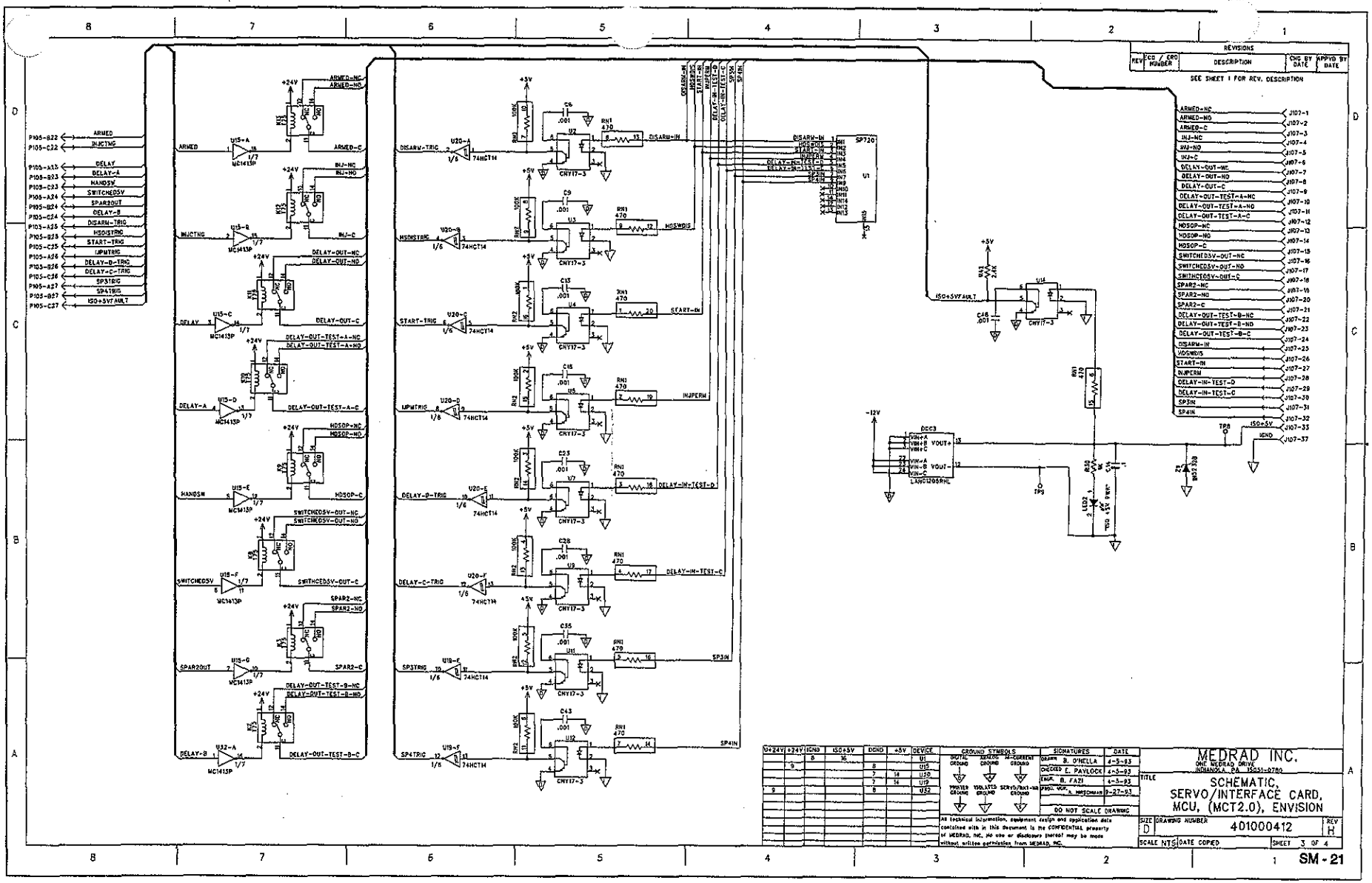
MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE: SCHEMATIC, SERVO/INTERFACE CARD, MCU, (MCT2.0), ENVISION

SIZE D | DRAWING NUMBER 401000412 | REV H

SCALE NTS | DATE COPIED | SHEET 2 OF 4


REVISIONS
REV | ECO / ORD NUMBER | DESCRIPTION | CHG BY DATE | APPVD BY DATE
SEE SHEET 1 FOR REV. DESCRIPTION
P105-B22 ARMED
P105-C22 INJCTNG
P105-A23 DELAY
P105-B23 DELAY-A
P105-C23 HANDSW
P105-A24 SWITCHEDSV
P105-B24 SPAR2OUT
P105-C24 DELAY-B
P105-A25 DISARM-TRIG
P105-B25 HSOISTRIG
P105-C25 START-TRIG
P105-A26 INPMTRIG
P105-B26 DELAY-B-TRIG
P105-C26 DELAY-C-TRIG
P105-A27 SP3TRIG
P105-B27 SP4TRIG
P105-C27 ISO+5VFAULT
ARMED-NC
ARMED-NO
ARMED-C
INJ-NC
INJ-NO
INJ-C
DELAY-OUT-NC
DELAY-OUT-NO
DELAY-OUT-C
DELAY-OUT-TEST-A-NC
DELAY-OUT-TEST-A-NO
DELAY-OUT-TEST-A-C
HDSOP-NC
HDSOP-NO
HDSOP-C
SWITCHEDSV-OUT-NC
SWITCHEDSV-OUT-NO
SWITCHEDSV-OUT-C
SPAR2-NC
SPAR2-NO
SPAR2-C
DELAY-OUT-TEST-B-NC
DELAY-OUT-TEST-B-NO
DELAY-OUT-TEST-B-C
DISARM-IN
WDSWDIS
START-IN
INJPERM
DELAY-IN-TEST-D
DELAY-IN-TEST-C
SP3IN
SP4IN
ISO+5V
ISOGND
J107-1
J107-2
J107-3
J107-4
J107-5
J107-6
J107-7
J107-8
J107-9
J107-10
J107-11
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J107-24
J107-25
J107-26
J107-27
J107-28
J107-29
J107-30
J107-31
J107-32
J107-33
J107-37
+24V
+5V
-12V
ISO+5VFAULT
MC1413P
74HCT14
CNY17-3
LAH01205RHL
SP720
MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780
TITLE
SCHEMATIC,
SERVO/INTERFACE CARD,
MCU, (MCT2.0), ENVISION
DRAWING NUMBER
401000412
SIZE D
REV H
SCALE NTS
SHEET 3 OF 4
DO NOT SCALE DRAWING
SIGNATURES
DATE
DRAWN B. O'HELLA 4-5-93
CHECKED E. PAYLOCK 4-5-93
ENGR. B. FAZI 4-5-93
PROJ. MGR. A. HERSHMAN 9-27-93
GROUND SYMBOLS
DIGITAL GROUND
ANALOG GROUND
RF-CURRENT GROUND
PROTECTIVE GROUND
ISOLATED GROUND
SERVO/RAX1-HA GROUND
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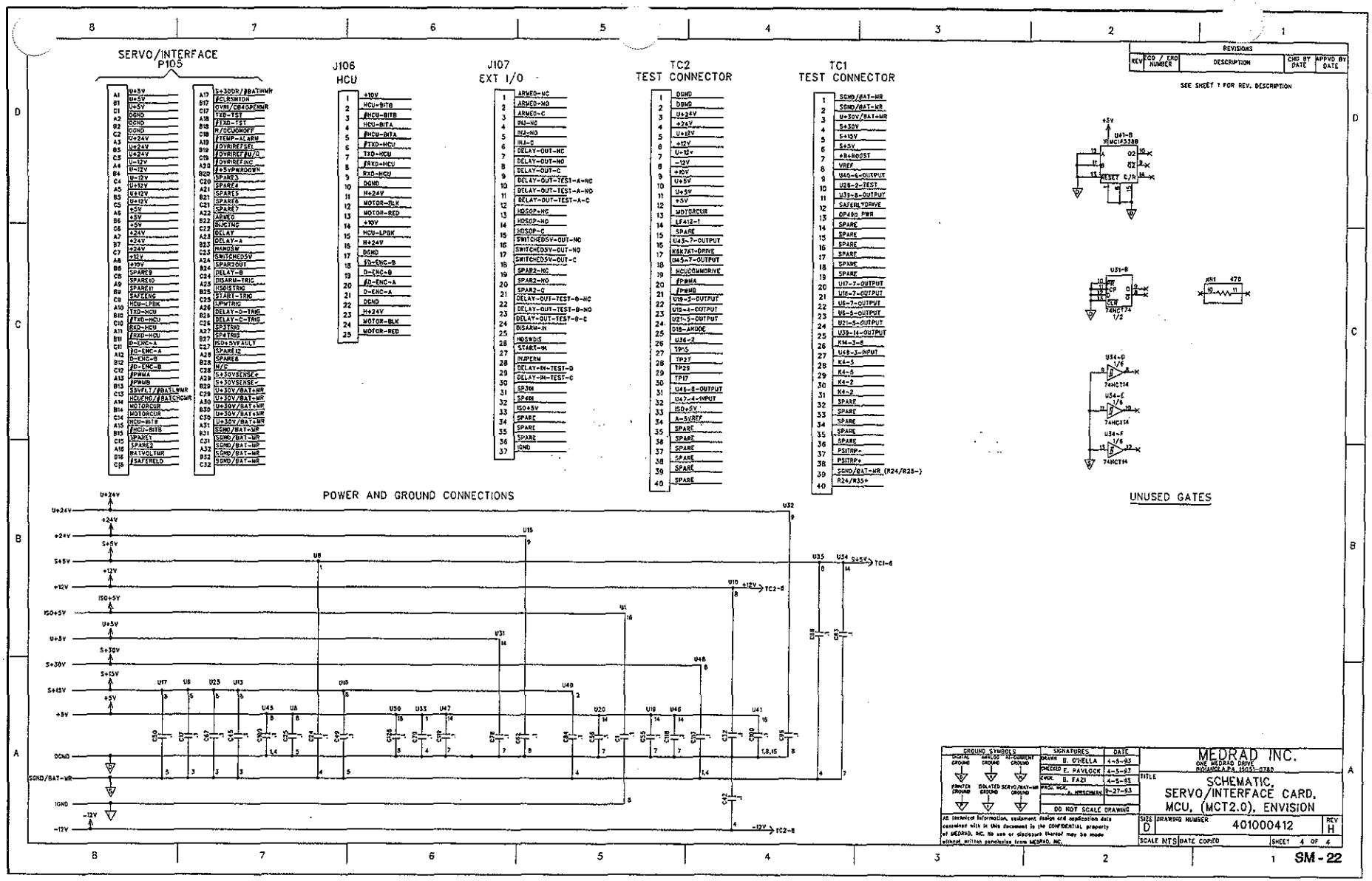
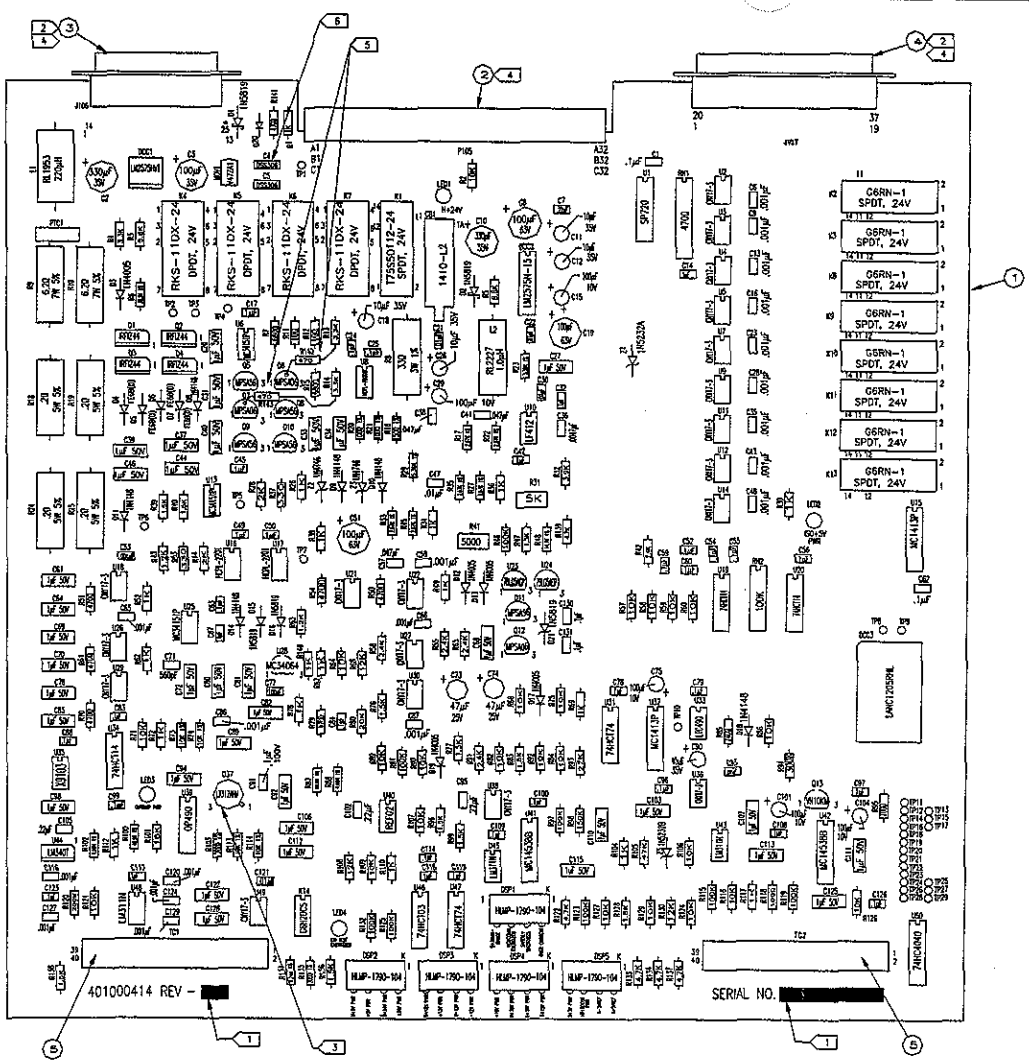
SM - 21

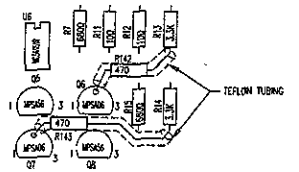

SERVO/INTERFACE P105
J106 HCU
J107 EXT I/O
TC2 TEST CONNECTOR
TC1 TEST CONNECTOR
REVISIONS
SEE SHEET 1 FOR REV. DESCRIPTION
POWER AND GROUND CONNECTIONS
UNUSED GATES
GROUND SYMBOLS
SIGNATURES
DO NOT SCALE DRAWING
MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA,PA 15051-0780
SCHEMATIC,
SERVO/INTERFACE CARD,
MCU, (MCT2.0), ENVISION
401000412
SCALE NTS
SHEET 4 OF 6
SM - 22



REVISIONS				
REV	ECO NO/ECO NO	DESCRIPTION	ORIG BY/DATE	APP'VD.
G	EC-2365	SEE PREVIOUS REV. CAD REGEN-ERATED, ADDED ITEM 88	RJS 10-14-96	DZ 10-24-96
H	EC-2496	REVISED NOTES, ITEMS 3,4	JMW 1-15-97	DZ 1-22-97
J	EC-2524	REMOVED R111	RJS 2-10-97	DZ 2-10-97
K	EC-2611	ITEM 88 QTY WAS 4	RJS 3-26-97	DZ 4-1-97
L	EC-2654	ADDED R142,143, NOTE 5	RJS 4-21-97	DZ 4-22-97
M	EC-2826	7W 5% WAS 7W 1%	RJS 9-8-97	DZ 9-8-97
N	EC-2863	ADDED NOTE 6	RJS 10-15-97	DZ 10-23-97
P	EC-3611	GENERAL REVISION	RJS 4-10-98	DZ 4-21-99
R	EC-3663	GENERAL REVISION	RJS 5-26-98	DZ 5-28-99
S	EC-3776	GENERAL REVISION	RJS 7-14-98	DZ 7-28-99
T	EC-3994	UPDATED BILL OF MATERIALS	RJS 12-3-99	

6 LIGHT GUIDED INSERTION ORIGIN LOCATION IS THE THIRD EYELET ON RIGHT SIDE OF C4

5 AFTER WAVE INSTALL R143 FROM PIN 2 OF Q7 TO BOTTOM OF R14 WITH 12 GA TEFLON TUBING AS REQUIRED. REPEAT WITH R142 FROM PIN 2 OF Q6 TO BOTTOM OF R13.



4 TAPE THE UNDERSIDE OF THESE CONNECTORS BEFORE WAVE.

3 THIS PART MUST BE ELEVATED OFF THE BOARD.

2 J106 AND J107 MUST BE DRYED THOROUGHLY USING COMPRESSED AIR AFTER WATER WASH.

1 SERIAL NUMBER AND REVISION TO BE FILLED IN USING PERMANENT INK OR PRE-PRINTED LABEL. (ITEM 134)

NOTES:

REFERENCE
FABRICATION DWG. - 401000413
SCHEMATIC - 401000412

GEOMETRIC TOLERANCES		STANDARD DIMENSIONS	UNLESS OTHERWISE SPECIFIED	SIGNATURES	DATE
SYMBOL	CHARACTERISTIC			DRAWN S. SCHOUL	6-7-93
				ENGR E. PAVLOCK	5-29-93
				QUAL B. FAZI	6-7-93
				MFG R. HIRSCHMAN	9-28-93
			DO NOT SCALE DRAWING		

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MEDRAD® INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE: ASSEMBLY, MCU, SERVO CARD, ENVISION

SIZE D | DWG. NUMBER 401000414 | REV. T

SCALE: NTS | DATE COPIED: | SHEET 1 OF 4

BILL OF MATERIAL

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
1	PCB	401000413	1			
2	CONN., EURO-DIN, 96POS. MALE, RT/A,96 PIN	518-5364-055	1	P105	BW	
3	CONN., 25P, "D" FILT., FEM., RT/A	519-6724-057	1	J106	BW	
4	CONN., 37P, "D" FILT., FEM., RT/A	519-6734-023	1	J107	BW	
5	CONN., 40P, DBL. ROW, AMP-103309-8	518-1033-098	2	TC1,TC2	BW	
6	IC, QUAD 2IN OD NAND, 74HCT03	074-74HT-003	1	U46	DIP	
7	IC, ESD ARRAY, SP720P	049-0720-000	1	U1	DIP	
8	IC, OPTOISO, CNY17-3(-2)	097-0173-000	19	U2-5,7,9,11,12,14,18,	DIP	
				21,22,26,27,29,30,36,38,49		
9	IC, DRIVER ARRAYS, MOT. MC1413P	072-1413-000	2	U15,32	DIP	
10	IC, HEX INV., 74HCT14	074-74HT-014	3	U19,20,34	DIP	
11	IC, DUAL, INV., MC34151P	019-3415-100	3	U6,13,25	DIP	
12	IC, ISO. AMP, HCPL-7800B	048-7800-000	1	U8	DIP	
13	IC, OP AMP, JFET, DUAL, LF412ACN	050-0412-000	1	U10	DIP	
14	IC, VOLTAGE REG., -5V, 79L05ACP	052-7905-005	1	U24	BW	
15	IC, VOLTAGE REG., 5V, 78L05ACP	052-7805-005	1	U23	BW	
16	IC, LOGIC OPTO, HCPL-2201	099-2201-000	2	U16,17	DIP	
17	IC, DUAL D-FLIP-FLOP, 74HCT74	074-74HT-074	2	U31,47	DIP	
18	IC, LOW VOLTAGE QUAD OPAMP, OP490GP	060-0490-000	1	U39	DIP	
19	IC, REF, +5V +/-25mV, REF02	052-4102-005	1	U40	DIP	
20	IC, UNDER VOLT DET., MC34064P-5	049-3406-450	1	U28	BW	
21	IC, VOLT COMPAR, LM311N	052-0311-050	3	U43,45,48	DIP	
22	IC, MULTIVIBRATOR, MONOSTABLE, MC14538B	005-1453-800	2	U41,42	DIP	
23	IC, VOLTAGE REG., 5V, LM340T	051-0340-502	1	U44	BW	
24	IC, VOLTAGE REG., LT317AHVH	052-0317-001	1	U37	BW	
25	IC, 422 DRV/RCV, LTC490CN	054-4900-800	1	U33	DIP	
26	IC, 12-STAGE BINARY COUNTER, 74HC4040	004-4040-031	1	U50	DIP	
27	IC, EEPOT, DIG, CON, X9C103	009-9103-000	1	U35	DIP	
28						
29						
30	CAPACITOR, ELEC, 10µF, 35V	204-0106-135	5	C11,12,18,26,90	LG	
31	CAPACITOR, CER, .01µF, 50V	201-0103-050	6	C21,22,30,47,93,121	LG	
32	CAPACITOR, FILM, 1µF, 50V	214-0105-050	36	C20,27,31,33,34,37,39,40,44	LG	
				46,61,64,68,69,70,72,76,		
				80,81,82,85,89,92,94,98,103		
				106,107,110-113,115,122,125,128		

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
33	CAPACITOR, CER, .1µF, 50V	201-0104-050	38	C1,14,17,24,25,32,42,45,49,50,52,	LG	
				54-56,59,60,62,63,67,78,79,83,84,88,96,97		
				99,100,108,109,114,117-119,123,126,130,131		
34	CAPACITOR, CER, .001µF, 100V	201-0102-050	20	C6,9,13,16,23,28,35,43,48,53,58,	LG	
				65,66,86,87,116,120,124,127,129		
35	CAPACITOR, CER, .047µF, 25V	203-0503-200	3	C38,41,57	LG	
36	CAPACITOR, ELEC, 100µF, 63V	204-0107-063	3	C8,19,51	LG	
37	CAPACITOR, ELEC, 100µF, 10V	204-0107-010	5	C15,29,101,104,75	LG	
38	CAPACITOR, CER, .22µF, 50V	201-0224-050	4	C7,95,102,105	LG	
39	CAPACITOR, CER, 100PF, 100V	201-0101-050	1	C77	LG	
40	CAPACITOR, ELEC, 47µF, 25V	204-0476-025	2	C73,74	LG	
41	CAPACITOR, CER, 560PF, 50V	201-0561-050	1	C71	LG	
42	CAPACITOR, CER, .0047µF, 100V	201-0472-050	1	C36	LG	
43	CAPACITOR, ELEC, 330µF, 35V	204-0337-350	2	C2,10	LG	
44	CAPACITOR, CER, .1µF, 100V	201-0104-100	1	C91	LG	
45	CAPACITOR, ELEC., 100µF, 35V	204-0107-350	1	C3	LG	
46						
47						
48						
49	RESISTOR, M/FILM, 1.24KΩ, 1/4W, 1%	313-1241-000	1	R131	AXI	
50	RESISTOR, C/FILM, 4.7KΩ, 1/4W, 5%	303-0472-000	5	R122,133,134,137,139	AXI	
51	RESISTOR, COMP. OXIDE, .2Ω, 5W, 5%	342-0002-005	4	R18,19,24,25	BW	
52	RESISTOR, C/FILM, 10Ω, 1/4W, 5%	303-0100-000	2	R11,12	AXI	
53	RESISTOR, C/FILM, 680Ω, 1/4W, 5%	303-0681-000	2	R7,15	AXI	
54	RESISTOR, C/FILM, 3.3KΩ, 1/4W, 5%	303-0332-000	3	R4,13,14	AXI	
55	RESISTOR, C/FILM, 2.4KΩ, 1/4W, 5%	303-0242-000	5	R42,55,56,65,91	AXI	

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SIGNATURES		DATE
DRAWN	S. SCHOLL	6-7-93
CHECKED	E. PAVLOCK	6-7-93
ENGR.	B. FAZI	6-7-93
PROJ. MGR.	A. HIRSCHMAN	9/28/93

SEE SHT. 1 FOR REV. LEVEL

MEDRAD® INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE
ASSEMBLY, MCU, SERVO CARD, ENVISION

DWG. NUMBER 401000414 REV. T

DATE COPIED

SHEET 2 OF 4

BILL OF MATERIAL

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
56	RESISTOR, M/FILM, 150Ω, 1/4W, 1%	313-1500-000	1	R16	AXI	
57	RESISTOR, M/FILM, 2.67KΩ, 1/4W, 1%	313-2671-000	6	R17,22,27,33,35,45	AXI	
58	RESISTOR, M/FILM, 100Ω, 1/4W, 1%	313-1000-000	2	R20,21	AXI	
59	RESISTOR, M/FILM, 5.36KΩ, 1/4W, 1%	313-5361-000	2	R23,29	AXI	
60	RESISTOR, C/FILM, 1.2KΩ, 1/4W, 5%	303-0122-000	2	R43,63	AXI	
61	RESISTOR, C/FILM, 2KΩ, 1/4W, 5%	303-0202-000	2	R28,44	AXI	
62	RESISTOR, C/FILM, 3.9KΩ, 1/4W, 5%	303-0392-000	1	R32	AXI	
63	RESISTOR, M/FILM, 14.7KΩ, 1/4W, 1%	313-1472-000	1	R48	AXI	
64	RESISTOR, COMP. OXIDE, 6.2Ω, 7W, 5%	342-0062-007	2	R9,10	BW	
65	RESISTOR, C/FILM, 10KΩ, 1/4W, 5%	303-0103-000	24	R2,57-60,64,66,71,75,	AXI	
				82,84,86,89,90,92,106,107,109,		
				116,121,124,126,127,129		
66	RESISTOR, C/FILM, 1.5KΩ, 1/4W, 5%	303-0152-000	11	R40,39,47,76,77,	AXI	
				83,96,99,128,136,138		
67	RESISTOR, C/FILM, 1KΩ, 1/4W, 5%	303-0102-000	18	R1,26,30,34,36,38,49,52,	AXI	
				62,72,78,104,110,112,117,67,69,140		
68	RESISTOR, C/FILM, 100KΩ, 1/4W, 5%	303-0104-000	8	R46,81,97,115,	AXI	
				119,123,125,132		
69	RESISTOR, 300KΩ, 1/4W, 5%	303-0304-000	1	R94	AXI	
70	RESISTOR, C/FILM, 12KΩ, 1/4W, 5%	303-0123-000	3	R68,108,130	AXI	
71	RESISTOR, C/FILM, 27KΩ, 1/4W, 5%	303-0273-000	1	R93	AXI	
72	RESISTOR, C/FILM, 330Ω, 1/4W, 5%	303-0331-000	2	R37,53	AXI	
73	RESISTOR, M/FILM, 150KΩ, 1/4W, 1%	313-1503-000	1	R98	AXI	
74	RESISTOR, C/FILM, 240Ω, 1/4W, 5%	303-0241-000	1	R85	AXI	
75	RESISTOR, C/FILM, 100Ω, 1/4W, 5%	303-0101-000	2	R95,118	AXI	
76	RESISTOR, M/FILM, 39.2KΩ, 1/4W, 1%	313-3902-000	1	R6	AXI	
77	RESISTOR, M/FILM, 4.99K, 1/4W 1%	313-4991-000	2	R88,102	AXI	
78	RESISTOR, M/FILM, 49.9K, 1/4W, 1%	313-4992-000	2	R87,100	AXI	
79	RESISTOR, M/FILM, 200Ω, 1/4W, 1%	313-2000-000	2	R103,135	AXI	
80	RESISTOR, C/FILM, 6.8KΩ, 1/4W, 5%	303-0682-000	1	R5	AXI	
81	RESISTOR, C/FILM, 470Ω, 1/4W, 5%	303-0471-000	9	R50,51,54,61,70,79,142,143	AXI	
				R141	BW	
82	RESISTOR, C/FILM, 20KΩ, 1/4W, 5%	303-0203-000	1	R80	AXI	
83	RESISTOR, C/FILM, 200KΩ, 1/4W, 5%	303-0204-000	1	R120	AXI	
84	RESISTOR, C/FILM, 47KΩ, 1/4W, 5%	303-0473-000	1	R105	AXI	
85	RESISTOR, C/FILM, 18K, 1/4W, 5%	303-0183-000	1	R101	AXI	
86	RESISTOR, C/FILM, 5.6K, 1/4W, 5%	303-0562-000	1	R3	AXI	

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
87	RESISTOR, M/FILM, 10K, 1/4W, 1%	313-1002-000	4	R73,74,113,114	AXI	
88	RESISTOR, COMP. OXIDE 33Ω 3W 5%	307-0330-000	1	R8	BW	
89	RESISTOR NETWORK, 10 ISO, 470Ω	341-4120-471	1	RN1	AW,HC	
90	RESISTOR NETWORK, 8 ISO., 100K	341-4116-104	1	RN2	AW,HC	
91						
92	DIODE, SW, HI SPEED, 1N4148	105-4148-000	6	D8-11,14,18	AXI	
93	DIODE, RECT, 1N4005	106-4005-000	6	D3,12,13,17,19,20	LG	
94	DIODE, RECT, SCH, 1N5819, MOT	106-5819-000	5	D1,2,15,16,21	LG	
95	DIODE, RECT, 6A/100V, FEB6(D)	106-0006-000	4	D4-7	BW	
96						
97	DIODE, ZEN, 18V, 1N4746	102-4746-100	2	Z2,3	BW	
98						
99	DIODE, ZEN, 5.6V, 1N5232B	101-5232-050	2	Z1,5	LG	
100						
101	PTC, RXE-135	475-0135-000	1	PTC1	BW	
102	FILTER, EMI, MURRATA	199-3064-103	2	C4,5	BW	
103						
104						
105	FET, N-PWR, ISO TO-220, MTA30N06E	175-3006-000	4	Q1-4	BW	
106	XISTOR, AMP, NPN, MPSA06	092-0006-000	3	Q6,7,12	BW	
107	XISTOR, AMP, PNP, MPSA56	092-0056-000	5	Q5,8-10,11	BW	
108	XISTOR, FET PWR, N-CH, VN10KM	019-0010-000	1	Q13	BW	
109						
110						
111	POT, TRIM, 25-T, 500Ω	360-0501-025	1	R41	BW	
112	POT, TRIM, 25-T, 5KΩ	360-0502-025	1	R31	BW	

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SIGNATURES		DATE
DRAWN	S. SCHOLL	6-7-93
CHECKED	E. PAVLOCK	6-7-93
ENGR.	B. FAZI	6-7-93
PROJ. MGR.	A. HIRSCHMAN	9/28/93

SEE SHT. 1 FOR REV. LEVEL

MEDRAD® INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE
ASSEMBLY, MCU, SERVO CARD, ENVISION

DWG. NUMBER 401000414 REV. T

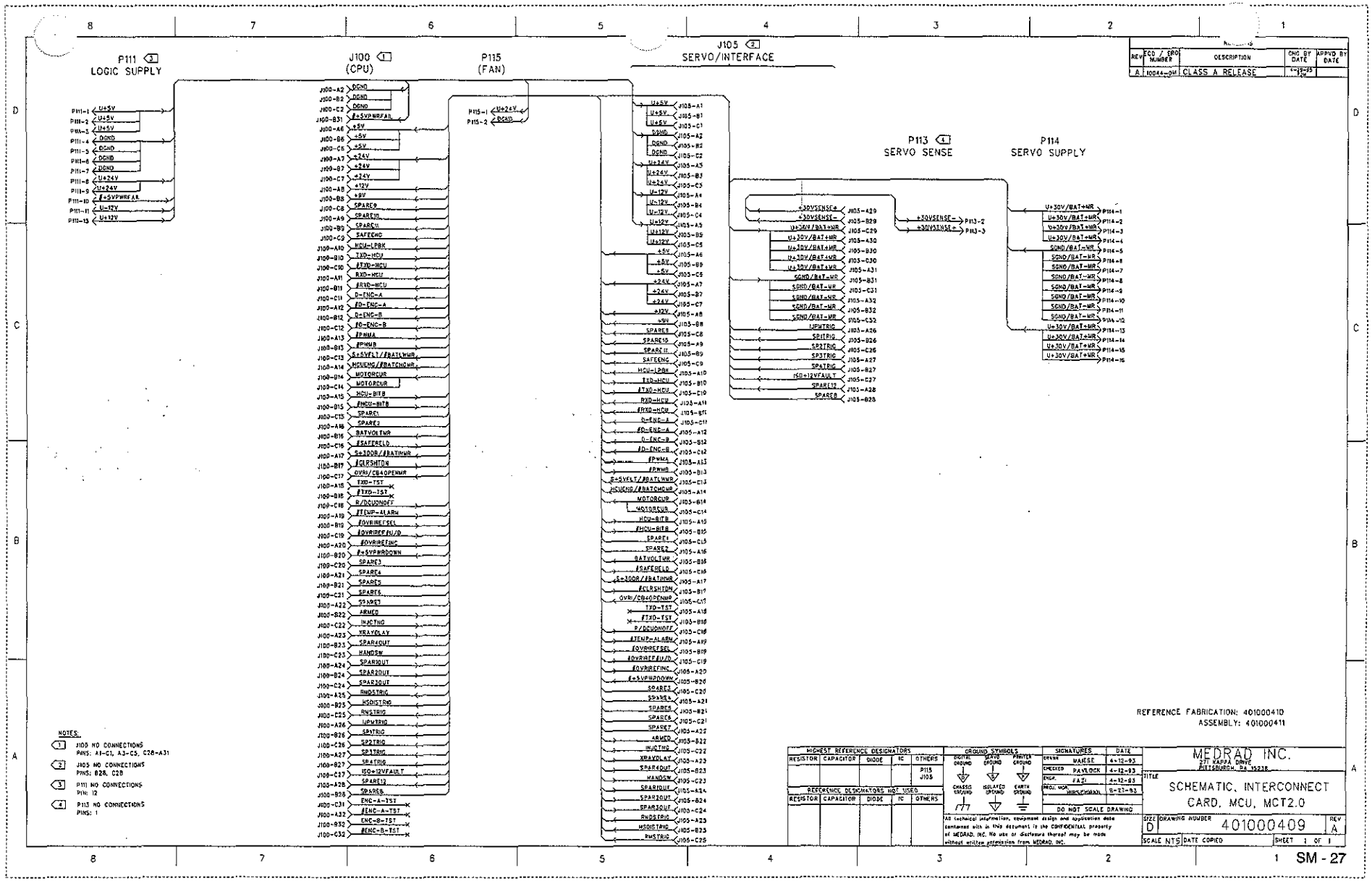
DATE COPIED

SHEET 3 OF 4

BILL OF MATERIAL

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
113	RELAY, SPDT, 24V, T75S5D112-24	400-0124-000	1	K1	BW	
114	RELAY, DPDT, 24V, RKS-11DX-24	400-0224-000	4	K4-7	BW	
115	RELAY, DPDT, 5VDC, G6H-2-DC5	406-2005-000	1	K14	BW	
116						
117						
118	DISPLAY, LED, QUAD, HLMP-1790-104	485-1790-104	5	DSP1-5	BW	
119	LED, CMD5753, "RED"	094-5753-000	4	LED1-4	LG	
120						
121						
122	BREAKER, 1AMP, 1410-L210-L2F1-S02-1.0ETA	475-1410-001	1	CB1	BW	
123						
124						
125	DC-DC, ADJ, 1A, LM2575HVT-ADJ, NAT	051-2575-000	1	DCC1	BW	
126	DC-DC, 15V, 1A, LM2575N-15, NAT	051-2575-001	1	DCC2	DIP	
127	DC-DC, 5V, 300mA, LANC1205RHL	041-1205-000	1	DCC3	LG	
128						
129						
130	CHOKE, 1.0mH	270-2227-000	1	L2	BW	
131	CHOKE, 220uH, 1.25ADC, RL1953, RENCO	270-1953-220	1	L1	BW	
132	VAR, METAL, ERZ-C07DK470, PANA	110-0471-000	1	MOV1	BW	
133	LABEL, BLANK, SERIAL NUMBER	550-4426-100	1			NOTE 1
134	RELAY,SPDT,24V G6RN-1	3003364	8	K2,3,K8-13	BW	
135						
136						
137						
138						
139						
140						
141						
142						
143						
144						
145						
146						
147						
148						

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE


P111 3
LOGIC SUPPLY
J100 1
(CPU)
P115
(FAN)
J105 2
SERVO/INTERFACE
P113 4
SERVO SENSE
P114
SERVO SUPPLY
P111-1 U+5V
P111-2 U+5V
P111-3 U+5V
P111-4 DGND
P111-5 DGND
P111-6 DGND
P111-7 DGND
P111-8 U+24V
P111-9 U+24V
P111-10 E+5VPWRFAIL
P111-11 U-12V
P111-12 U+12V
P115-1 U+24V
P115-2 DGND
J100-A2 DGND
J100-B2 DGND
J100-C2 DGND
J100-B3 E+5VPWRFAIL
J100-A6 +5V
J100-B6 +5V
J100-C6 +5V
J100-A7 +24V
J100-B7 +24V
J100-C7 +24V
J100-A8 +12V
J100-B8 +8V
J100-C8 SPARE9
J100-A9 SPARE10
J100-B9 SPARE11
J100-C9 SAFEENG
J100-A10 MCU-LPBK
J100-B10 TXD-MCU
J100-C10 RTXD-MCU
J100-A11 RXD-MCU
J100-B11 RRXD-MCU
J100-C11 D-ENC-A
J100-A12 /D-ENC-A
J100-B12 D-ENC-B
J100-C12 /D-ENC-B
J100-A13 /PWMA
J100-B13 /PWMB
J100-C13 S+5VFLT/RBATLWMR
J100-A14 MCUENG/RBATCHGMR
J100-B14 MOTORCUR
J100-C14 MOTORCUR
J100-A15 MCU-BITB
J100-B15 /MCU-BITB
J100-C15 SPARE1
J100-A16 SPARE2
J100-B16 BATVOLTMR
J100-C16 RSAFEFELD
J100-A17 S+300R/RBATMMR
J100-B17 /CLRSHTDN
J100-C17 OVRI/CB40PENMR
J100-A18 TXD-TST
J100-B18 /TXD-TST
J100-C18 P/DOUNOFF
J100-A19 /TEMP-ALARM
J100-B19 /OVRIREFSEL
J100-C19 /OVRIREFAU/D
J100-A20 /OVRIREFINC
J100-B20 /+5VPWRDOWN
J100-C20 SPARE3
J100-A21 SPARE4
J100-B21 SPARE5
J100-C21 SPARE6
J100-A22 SPARE7
J100-B22 ARMED
J100-C22 INJCTNG
J100-A23 XRAYDLAY
J100-B23 SPAR4OUT
J100-C23 WANDSW
J100-A24 SPAR3OUT
J100-B24 SPAR2OUT
J100-C24 SPAR1OUT
J100-A25 RHDSTRIG
J100-B25 HSDISTRIG
J100-C25 RWSTRIG
J100-A26 LPWTRIG
J100-B26 SP4TRIG
J100-C26 SP2TRIG
J100-A27 SP1TRIG
J100-B27 SP3TRIG
J100-C27 ISO+12VFAULT
J100-A28 SPARE12
J100-B28 SPARE8
J100-C31 ENC-A-TST
J100-A32 /ENC-A-TST
J100-B32 ENC-B-TST
J100-C32 /ENC-B-TST
J105-A1 U+5V
J105-B1 U+5V
J105-C1 U+5V
J105-A2 DGND
J105-B2 DGND
J105-C2 DGND
J105-A3 U+24V
J105-B3 U+24V
J105-C3 U+24V
J105-A4 U-12V
J105-B4 U-12V
J105-C4 U-12V
J105-A5 U+12V
J105-B5 U+12V
J105-C5 U+12V
J105-A6 +5V
J105-B6 +5V
J105-C6 +5V
J105-A7 +24V
J105-B7 +24V
J105-C7 +24V
J105-A8 +12V
J105-B8 +8V
J105-C8 SPARE9
J105-A9 SPARE10
J105-B9 SPARE11
J105-C9 SAFEENG
J105-A10 MCU-LPBK
J105-B10 TXD-MCU
J105-C10 RTXD-MCU
J105-A11 RXD-MCU
J105-B11 RRXD-MCU
J105-C11 D-ENC-A
J105-A12 /D-ENC-A
J105-B12 D-ENC-B
J105-C12 /D-ENC-B
J105-A13 /PWMA
J105-B13 /PWMB
J105-C13 S+5VFLT/RBATLWMR
J105-A14 MCUENG/RBATCHGMR
J105-B14 MOTORCUR
J105-C14 MOTORCUR
J105-A15 MCU-BITB
J105-B15 /MCU-BITB
J105-C15 SPARE1
J105-A16 SPARE2
J105-B16 BATVOLTMR
J105-C16 RSAFEFELD
J105-A17 S+300R/RBATMMR
J105-B17 /CLRSHTDN
J105-C17 OVRI/CB40PENMR
J105-A18 TXD-TST
J105-B18 /TXD-TST
J105-C18 P/DOUNOFF
J105-A19 /TEMP-ALARM
J105-B19 /OVRIREFSEL
J105-C19 /OVRIREFAU/D
J105-A20 /OVRIREFINC
J105-B20 /+5VPWRDOWN
J105-C20 SPARE3
J105-A21 SPARE4
J105-B21 SPARE5
J105-C21 SPARE6
J105-A22 SPARE7
J105-B22 ARMED
J105-C22 INJCTNG
J105-A23 XRAYDLAY
J105-B23 SPAR4OUT
J105-C23 WANDSW
J105-A24 SPAR3OUT
J105-B24 SPAR2OUT
J105-C24 SPAR1OUT
J105-A25 RHDSTRIG
J105-B25 HSDISTRIG
J105-C25 RWSTRIG
J105-A29 +30VSENSE+
J105-B29 +30VSENSE-
J105-C29 U+30V/BAT+MR
J105-A30 U+30V/BAT+MR
J105-B30 U+30V/BAT+MR
J105-C30 U+30V/BAT+MR
J105-A31 U+30V/BAT+MR
J105-B31 SGND/BAT-MR
J105-C31 SGND/BAT-MR
J105-A32 SGND/BAT-MR
J105-B32 SGND/BAT-MR
J105-C32 SGND/BAT-MR
J105-A26 LPWTRIG
J105-B26 SP1TRIG
J105-C26 SP2TRIG
J105-A27 SP3TRIG
J105-B27 SP4TRIG
J105-C27 ISO+12VFAULT
J105-A28 SPARE12
J105-B28 SPARE8
+30VSENSE+ P113-2
+30VSENSE- P113-3
U+30V/BAT+MR P114-1
U+30V/BAT+MR P114-2
U+30V/BAT+MR P114-3
U+30V/BAT+MR P114-4
SGND/BAT-MR P114-5
SGND/BAT-MR P114-6
SGND/BAT-MR P114-7
SGND/BAT-MR P114-8
SGND/BAT-MR P114-9
SGND/BAT-MR P114-10
SGND/BAT-MR P114-11
SGND/BAT-MR P114-12
U+30V/BAT+MR P114-13
U+30V/BAT+MR P114-14
U+30V/BAT+MR P114-15
U+30V/BAT+MR P114-16
NOTES:
1 J100 NO CONNECTIONS PINS: A1-C1, A3-C5, C28-A31
2 J105 NO CONNECTIONS PINS: B28, C28
3 P111 NO CONNECTIONS PIN: 12
4 P113 NO CONNECTIONS PINS: 1
REV
ECO / ERO NUMBER
DESCRIPTION
CNC BY DATE
APPVD BY DATE
A 10044-04 CLASS A RELEASE 4-19-93 TJW
REFERENCE FABRICATION: 401000410
ASSEMBLY: 401000411
HIGHEST REFERENCE DESIGNATORS
RESISTOR CAPACITOR DIODE IC OTHERS
P115 J105
REFERENCE DESIGNATORS NOT USED
RESISTOR CAPACITOR DIODE IC OTHERS
GROUND SYMBOLS
DIGITAL GROUND
SERVO GROUND
PRINTED GROUND
CHASSIS GROUND
ISOLATED GROUND
EARTH GROUND
SIGNATURES DATE
DRAWN MAKESE 4-12-93
CHECKED PAYLOCK 4-12-93
ENGR. FAZI 4-12-93
PROJ. MGR. 8-27-93
DO NOT SCALE DRAWING
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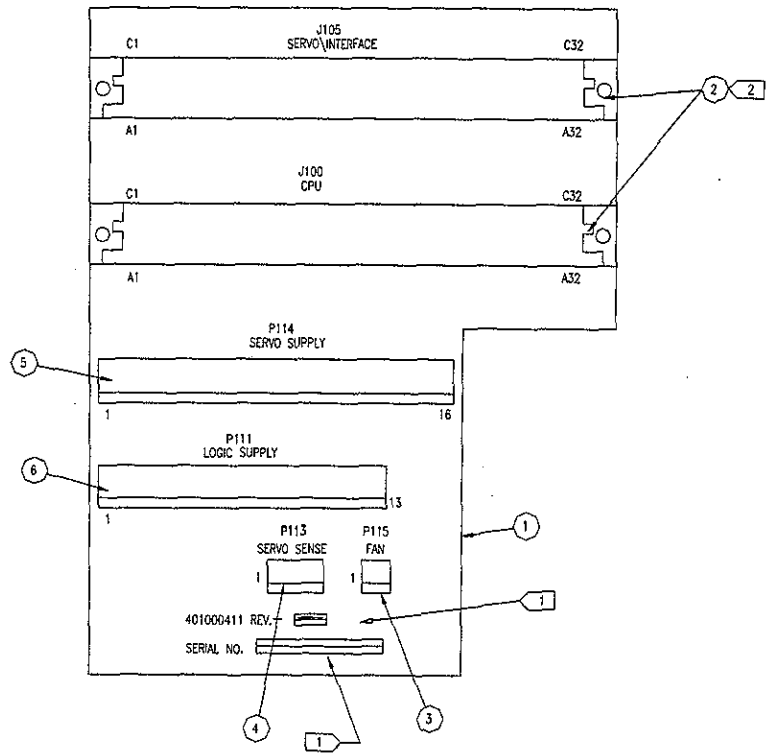
MEDRAD INC.
271 KAPPA DRIVE
PITTSBURGH, PA 15238
TITLE
SCHEMATIC, INTERCONNECT
CARD, MCU, MCT2.0
SIZE D
DRAWING NUMBER 401000409
REV A
SCALE NTS
DATE COPIED
SHEET 1 OF 1
SM - 27

REVISIONS				
REV	ECO/ERO NO	DESCRIPTION	CHG BY/DATE	APPVD.
A	10044-QH	CLASS A RELEASE	KDO 6-20-95	DPK 6-22-95
B	EC-3216	GENERAL REVISION	AW 7-16-98	JV 7/23/98
C	EC-3511	ADDED NOTED 2, REVISED TITLE	PDK 2/27/99	AW 3-2-99
D	EC-3971	ADDED BAR CODE, REV NOTE 1	SMC 11-22-99	



NOTES:

1. SERIAL NUMBER TO BE APPLIED USING PREPRINTED LABEL (ITEM 7) AND REVISION TO BE APPLIED USING PERMANENT INK.

2. IF WAVE SOLDERING, USE HIGH TEMPERATURE SOLDER TO TACK AT LEAST 3 PINS IN THE CENTER AND ONE PIN ON EACH END OF THE CONNECTORS.

REFERENCE – FABRICATION: 401000410
SCHEMATIC: 401000409

GEOMETRIC TOLERANCES	
SYMBOL	CHARACTERISTIC

STANDARD SYMBOLOGY: Ø DIAMETER; REF. DIM.; DIM. ORIGIN; CONICAL TAPER; SLOPE; C'BORE; C'SINK; DEPTH/DEEP; DIM. NOT TO SCALE

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES; TOLERANCES ON: 2 PL DECIMALS ±.01; 3 PL DECIMALS ±.005; FRACTIONS 0"–6" ±1/32; FRACTIONS 6"–UP ±1/16; ANGULAR ±0° 30'; MAX SURFACE TEXTURE

SIGNATURES		DATE
DRAWN	S. SCHOLL	6/7/93
CHECKED	E. PAVLOCK	5/29/93
ENGR.	B. FAZ	6/7/93
PROJ. MGR.	A. HIRSCHMAN	9/27/93

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MEDRAD® INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE: ASSEMBLY, MCU, INTERCONNECT, CARD, ENVISION

SIZE: C | DWG. NUMBER: 401000411 | REV: D

SCALE: 2X | DATE COPIED: | SHEET 1 OF 2

BILL OF MATERIAL

ITEM	DESCRIPTION	PART NUMBER	MFR. NAME	MFR. NUMBER	QTY	MATL	NOTES
1	PCB	401000410			1		
2	CONNECTOR, 96 PIN DIN, FEMALE, VERTICAL	3000162			2		J100,J105,BW
3	HEADER, 2 PIN	510-2021-002			1		P115, BW
4	HEADER, 3 PIN	510-2031-003			1		P113, BW
5	HEADER, 16 PIN	518-6404-456			1		P114, BW
6	HEADER, 13 PIN	518-6404-453			1		P111, BW
7	LABEL, BLANK SERIAL NO.	550-4426-100			1		NOTE1

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SIGNATURES		DATE
DRAWN	S. SCHOLL	6/7/93
CHECKED	E. PAVLOCK	5/29/93
ENGR.	B. FAZI	6/7/93
PROJ.MGR.	A. HIRSCHMAN	9/27/93

SEE SHT. 1 FOR REV. INFO.

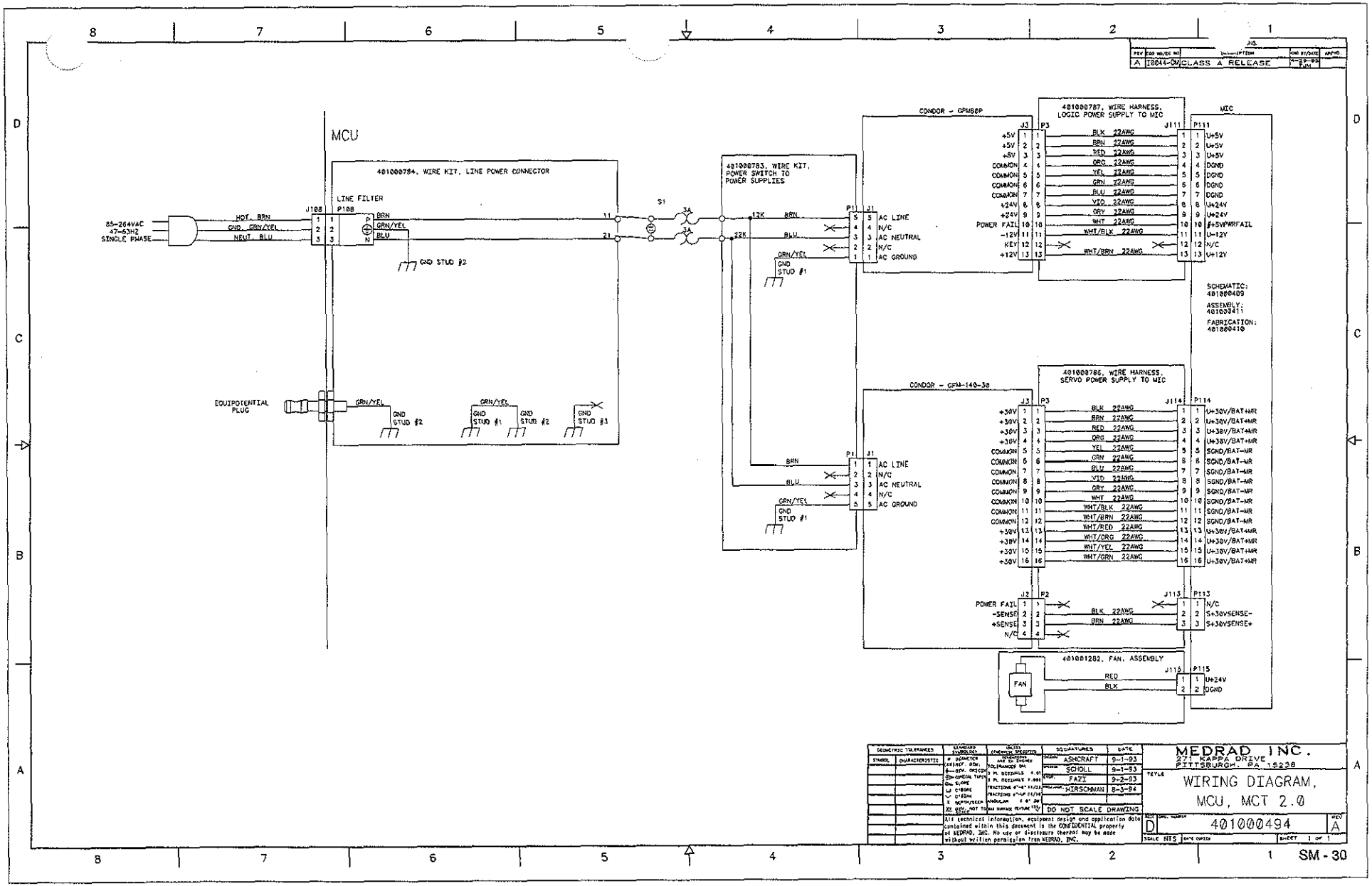
MEDRAD® INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE
ASSEMBLY, MCU, INTERCONNECT, CARD, ENVISION

DWG. NUMBER 401000411 REV. D

DATE COPIED:

SHEET 2 OF 2



REV	ECO NO/EC NO	DESCRIPTION	CHK BY/DATE	APP'VD
A	I0044-0M	CLASS A RELEASE	4-29-93 PJM	

DRAWN	ASHCRAFT	9-1-93
DESIGN	SCHOLL	9-1-93
ENGR	FAZI	9-2-93
PROJECT	HIRSCHMAN	8-3-94

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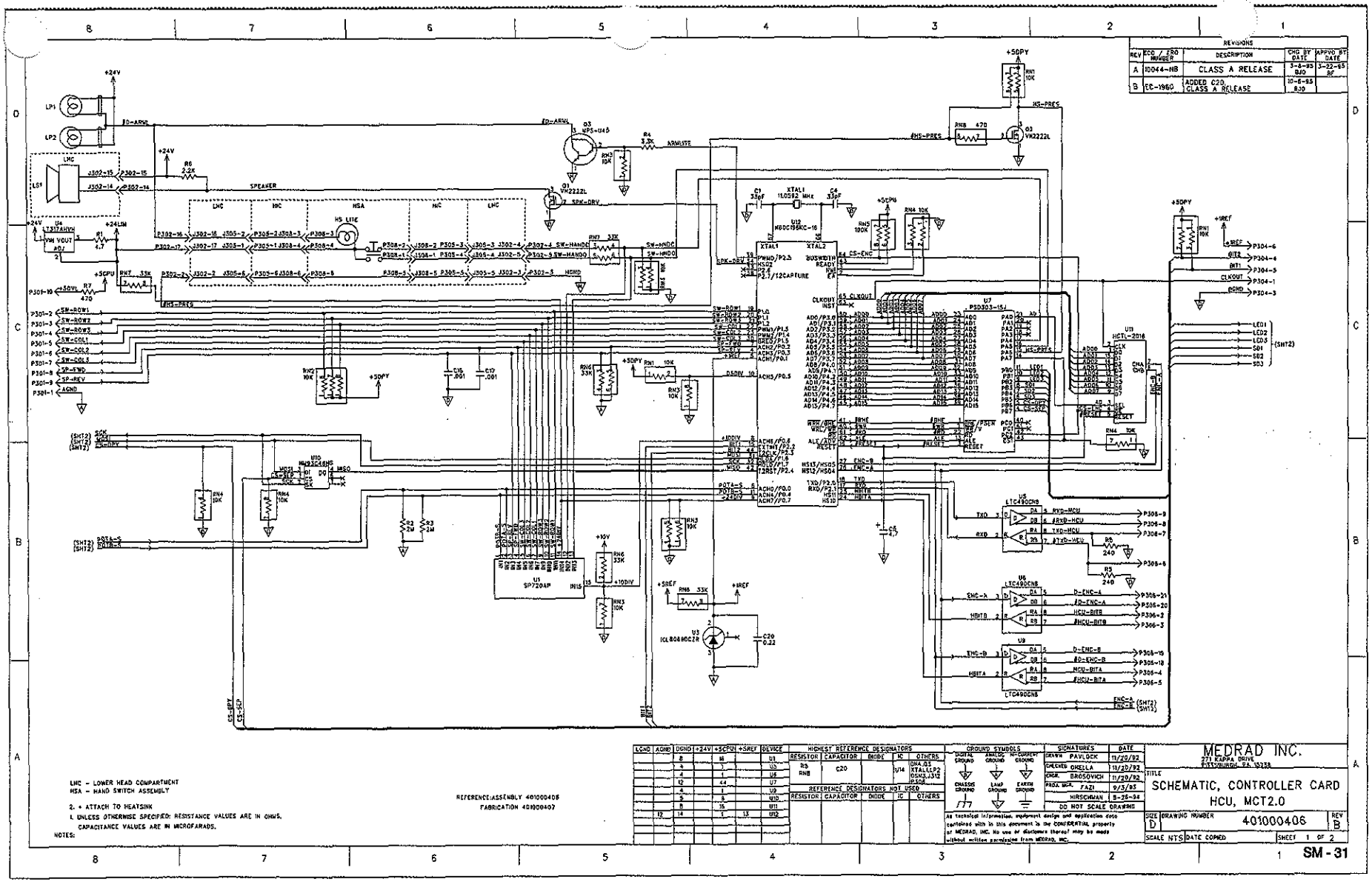
MEDRAD INC.
271 KAPPA DRIVE
PITTSBURGH, PA 15238

TITLE: WIRING DIAGRAM, MCU, MCT 2.0

SIZE D | DWG. NUMBER 401000494 | REV A

SCALE NTS | SHEET 1 OF 1

SM - 30



REVISIONS				
REV	ECO / ERO NUMBER	DESCRIPTION	CHG BY DATE	APPVD BY DATE
A	10044-MB	CLASS A RELEASE	3-6-93 BJO	3-22-93 BF
B	EC-1960	ADDED C20, CLASS A RELEASE	10-6-93 BJO	

LHC - LOWER HEAD COMPARTMENT
HSA - HAND SWITCH ASSEMBLY

2. + ATTACH TO HEATSINK
1. UNLESS OTHERWISE SPECIFIED: RESISTANCE VALUES ARE IN OHMS, CAPACITANCE VALUES ARE IN MICROFARADS.

NOTES:

REFERENCE ASSEMBLY 401000408
FABRICATION 401000407

LGND	AGND	DGND	+24V	+5CPU	+5REF	DEVICE
	8		16			U1
	4		1			U3
	4		1			U6
	12		44			U7
	4		1			U9
	5		8			U10
	8		16			U11
12	14		1	13		U12

HIGHEST REFERENCE DESIGNATORS				
RESISTOR	CAPACITOR	DIODE	IC	OTHERS
R5 RN8	C20		U14	DN4,D5 XTAL1,XTAL2 DSW3,JS12 P306

REFERENCE DESIGNATORS NOT USED				
RESISTOR	CAPACITOR	DIODE	IC	OTHERS

GROUND SYMBOLS: DIGITAL GROUND, ANALOG GROUND, RF-CURRENT GROUND, CHASSIS GROUND, LAND GROUND, EARTH GROUND

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SIGNATURES		DATE
DRAWN	PAVLOCK	11/20/92
CHECKED	OKELLA	11/20/92
ENGR.	BROSOVICH	11/20/92
PROD. ENGR.	FAZI	9/3/93
	HIRSCHMAN	5-26-94

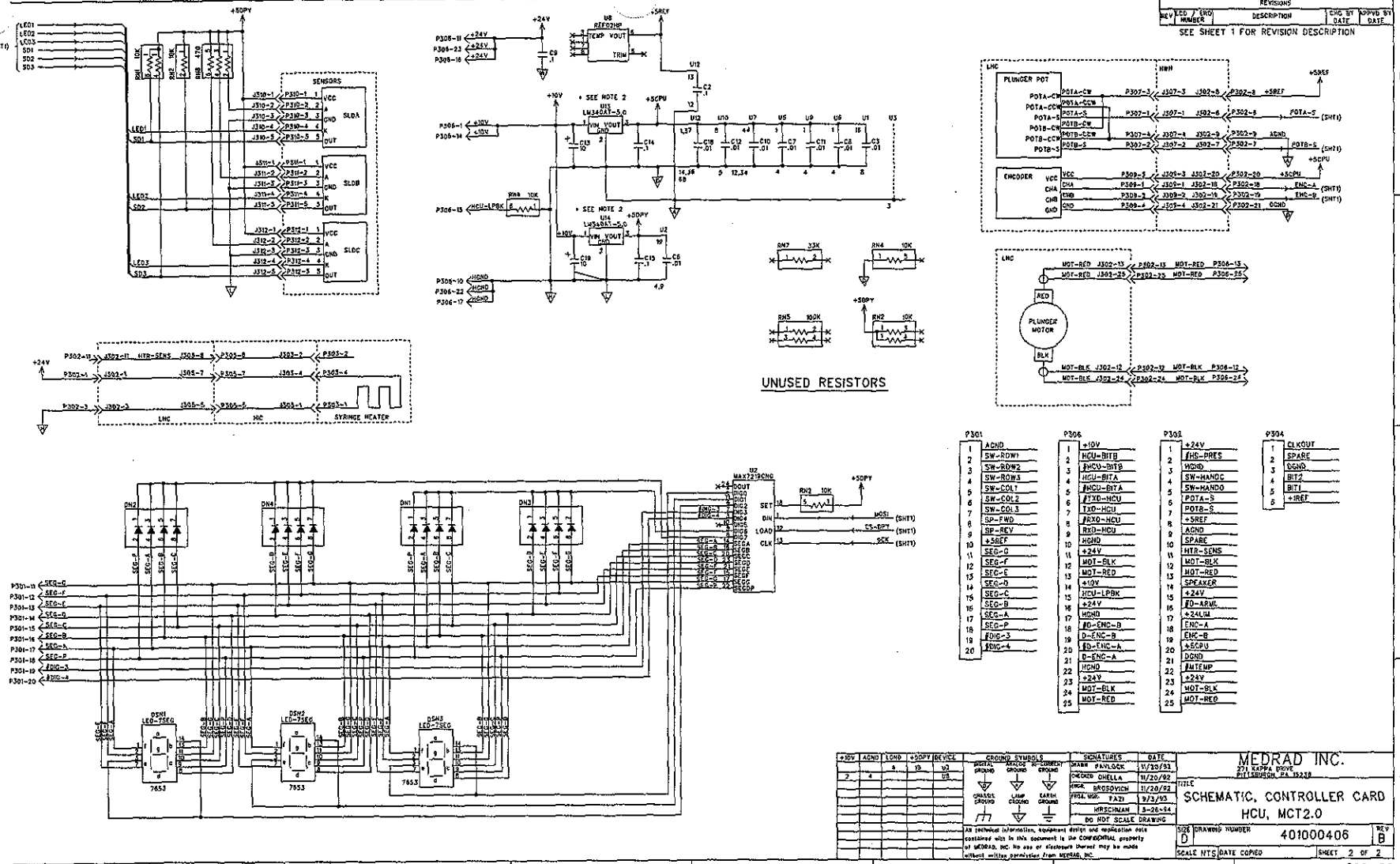
DO NOT SCALE DRAWING

MEDRAD INC.
271 KAPPA DRIVE
PITTSBURGH, PA 15238

TITLE: SCHEMATIC, CONTROLLER CARD HCU, MCT2.0

SIZE	DRAWING NUMBER	REV
D	401000406	B

SCALE NTS | DATE COPIED | SHEET 1 OF 2



REVISIONS

REV	ECO / ENG NUMBER	DESCRIPTION	ENG BY DATE	APPVD BY DATE

SEE SHEET 1 FOR REVISION DESCRIPTION

+10V	AGND	LGND	+5DPY	DEVICE
		9	19	V3
2	4			U5

GROUND SYMBOLS: DIGITAL GROUND, ANALOG GROUND, RF-CURRENT GROUND, CHASSIS GROUND, LAMP GROUND, EARTH GROUND

SIGNATURES	DATE
DRAWN P.WALLOCK	11/19/92
CHECKED D.WELLS	11/20/92
ENGR. BROSOVICH	11/20/92
PROJ. MGR. FAZI	9/3/93
HIRSCHMAN	5-26-94
DO NOT SCALE DRAWING	

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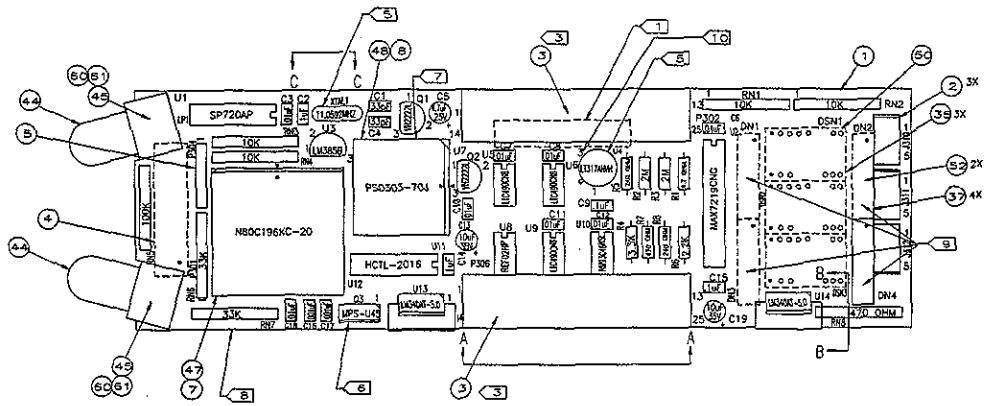
MEDRAD INC.
271 KAPPA DRIVE
PITTSBURGH, PA 15238

TITLE: SCHEMATIC, CONTROLLER CARD HCU, MCT2.0

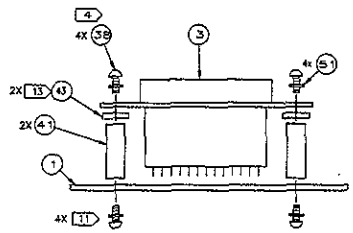
SIZE	DRAWING NUMBER	REV
D	401000406	B

SCALE NTS | DATE COPIED | SHEET 2 OF 2

REVISIONS				
REV	ECO/ERO NO	DESCRIPTION	DR BY/DATE	APPVD.
D	EC2449	CAD REGENERATED,DELEYED NOTE 4,ITEM 3 WAS 519-8420-120	EJP 12/12/96	DPK 1/2/97
E	EC2582	REVISED NOTE 6	EJP 2/28/97	TCK 3-3-97
F	EC-2863	ADDED NOTE 10	DJC 10-15-97	TCK 10/20/97
G	EC-3077	ADDED NOTES 4 & 11	ATC 3/26/98	TCK 3-27-98
H	EC-3106	REVISED ITEM 54	DJC 4-16-98	TCK 4-20-98
J	EC-3569	GENERAL REVISION	DJC 10-30-98	TCK 11-2-98
K	EC-3627	GENERAL REVISION	DJC 2-10-99	TCK 2-10-99
L	EC-3772	ITEM 18 WAS LG	DJC 7-20-99	

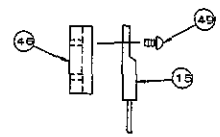


COMPONENT SIDE



VIEW "A-A"

2 ASSEMBLIES REQ'D - P302 & P306

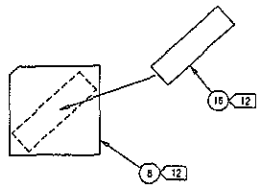


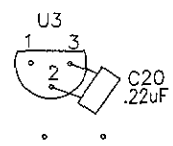
VIEW "B-B"

2 ASSEMBLIES REQ'D - U13 & U14

NOTES:

1. SERIAL NUMBER AND REVISION TO BE FILLED IN USING PERMANENT INK OR PREPRINTED LABEL (ITEM 62) IN AREA SHOWN.
2. ITEM 50,52,DSN1-3,DN1-4 AND P301 ARE INSTALLED ON THE SOLDER SIDE OF THE BOARD.
3. P302 AND P306 MUST BE DRYED THOROUGHLY USING COMPRESSED AIR AFTER WATER WASH.
4. RETIGHTEN HARDWARE AFTER WAVE.
5. THESE PARTS HAVE TO BE ELEVATED OFF THE BOARD.
6. IF THIS PART STICKS UP OFF THE BOARD MORE THAN 5/8" THEN THE HEATSINK TAB FOR THIS PART MUST BE BENT 90° INWARD BELOW THE MOUNTING HOLE.
7. U7 MUST BE PROGRAMMED.
8. BOARD EDGES MUST BE SANDED SMOOTH AFTER BOARDS ARE CUT OUT OF FIXTURE GRID.
9. USE THE LED FIXTURE TO CUT LEADS TO 1/8" $^{+1/16"}_{-0"}$ FOR ITEM 37.
10. LIGHT GUIDED INSERTION ORIGIN LOCATION IS U4, PIN3.
11. SOLDER MASK THE FOUR SCREWS ON THE UNDERSIDE OF THE BOARD BEFORE THE WAVE.
12. PROGRAM PARTS PER INSTRUCTION NO. 840164-00-PX-01. AFFIX ITEM 16 TO ITEM 8. ITEM 16 SHOULD CONTAIN THE FOLLOWING INFORMATION:
    HCU MCT 2.0
    VER X.X
    └ CURRENT SOFTWARE VERSION
13. ITEM 43 CAN BE INSTALLED ON EITHER END OF ITEM 41.





VIEW "C-C"

VIEW FROM SOLDER SIDE OF BOARD

REFERENCE: SCHEMATIC - 401000406
FABRICATION - 401000407

GEOMETRIC TOLERANCES		STANDARD TOLERANCES	UNLESS OTHERWISE SPECIFIED	SIGNATURES	DATE
SYMBOL	CHARACTERISTIC	± DIAMETER	DIMENSIONS ARE IN INCHES	DRAWN S. SCHOLL	6/7/93
		± DECIMAL PLACE	TOLERANCES ON:	DESIGN E. PAVLOCK	5/29/93
		± CONCAVE TAPER	2 PL DECIMALS ±.01	ENGR B. FAZ	6/7/93
		± SLOPE	3 PL DECIMALS ±.005	MFG A. HIRSCHMAN	10/5/93
		± C'BORE	FRACTIONS 6"-8" ±1/32		
		± DEPTH/DEEP	FRACTIONS 4"-10" ±1/16		
		± DIM NOT TO SCALE	ANGULAR ±0° 30'	DO NOT SCALE DRAWING	
			MAX SURFACE TEXTURE 63		

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MEDRAD® INC.
ONE MEDRAD DRIVE
INDIANOLA, PA 15051-0780

TITLE: ASSEMBLY, CONTROLLER CARD, HCU, ENVISION

SIZE: D | DWG. NUMBER: 401000408 | REV: L

SCALE: 2X | DATE COPIED: | SHEET 1 OF 2

SM - 33

BILL OF MATERIAL

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
1	PC CARD	401000407	1			
2	CONN., 5P, .050SP, ZIFLINE, 5-487576-0	518-4875-760	3	J310, 311, 312	BW	
3	SUBMIN. D CONN., 25P,AMP,842912-3	519-6721-152	2	P302,306	BW	
4	CONN., 20P, .050SP, ZIFLINE, 1-487576-2	518-4875-762	1	P301	AW	
5	HEADER, 6P, MALE, SIP, .1SP, 103747-6	518-1037-476	1	P304	BW	
6						
7	IC, MICROCONTROLLER, N80C196KC-20	070-0196-016	1	U12	AW	
8	IC, OTP PERIPHERAL, PSD303-70J, BLANK	3000653	1	U7	AW	
9	IC, ESD/OVERVOLT PROT. ARRAY, SP720	049-0720-000	1	U1	DIP	
10	IC, QUAD, DEC/CNTR/INTFCE, HCTL-2016	008-2016-000	1	U11	DIP	
11	IC, EEPROM, 1K, SER., NM93C46N	071-9346-000	1	U10	DIP	
12	IC, VOLT REG., POS ADJ., LT317AHVH	052-0317-001	1	U4	BW	
13	IC, DIFF DRV/RCV PR, LTC490CN8	054-4900-800	3	U5,6,9	DIP	
14	IC, DSPLY DRV, 8-DIG LED, MAX7219CNG	072-7219-000	1	U2	L.G.	
15	IC, VOLT REG., +5V, 2%, LM340AT-5.0	051-0340-502	2	U13,14	BW	
16	LABEL, BLANK	550-0017-619	1	U7		
17						
18	CAP, .22uF, 50V, CER.	201-0224-050	1	C20	AW	
19	CAP, 33pF, 100V, CER.	201-0330-100	2	C1,4	LG	
20	CAP, .01uF, 50V, CER.	201-0103-050	8	C3,6-8,10-12,18	LG	
21	CAP, .1uF, 50V, CER.	201-0104-050	4	C2,9,14,15	LG	
22	CAP, 10uF, 35V, ELEC.	204-0106-135	2	C13,19	LG	
23	CAP, 4.7uF, 25V, ELEC.	204-0475-125	1	C5	LG	
24	CAP, .001uF, 50V, CER.	201-0102-050	2	C16,17	LG	
25	RESISTOR, CF, 4.7 OHM, 1/4W,5%	303-0047-000	1	R1	AXI	
26	RESISTOR, CF, 240 OHM, 1/4W,5%	303-0241-000	1	R5,8	AXI	
27						
28	RES. NET., 8P SIP, 470 OHM, 4308R-102-471	341-4308-471	1	RN8	LG	
29	RES. NET., 8P SIP, 33K, 4308R-102-333	341-4308-333	2	RN6,7	LG	
30	RES. NET., 8P SIP, 10K, 4308R-101-103	340-4308-103	4	RN1-4	LG	
31	RES. NET., 8P SIP, 100K, 4308R-102-104	341-4308-104	1	RN5	LG	
32						
33	IC, REF, +5V, +/-25mV, REF02HP	052-4102-005	1	U8	DIP	
34						
35	LED, DSPLY, RED, .43", RHDP 5082-7653	485-5082-765	3	DSN1-3	AW	
36						
37	LED, BAR, 4, 8SIP, YEL., HLMP-2450	485-2450-000	4	DN1-4	AW	
38	SCREW, #4-40 x 1/4" LG., BHMS	602-0440-140	8		BW	
39	XISTOR, PWR DAR., NPN, MPS-U45	092-0045-000	1	Q3	BW	
40	FET, PWR, N-CH, 60V, TO-92, VN2222L	019-2222-000	2	Q1,2	BW	
41	F-F SPACER, #4-40 x 5/8" LG.	627-1458-041	4		BW	
42	XTAL, 11.0592MHZ, LOW PRO., FOXS/115-20	180-1105-920	1	XTAL1	BW	
43	WASHER, #4, FLAT	607-0004-932	4		BW	
44	LAMP, 28V, T-31/4 WEDGE, #657	481-0657-028	2	LP1,2	AW	
45	SOCKET, LAMP, T-31/4 WEDGE, 23-207	401001685	2	LP1,2	BW	
46	HEATSINK	401000739	2	U13,14	AW	
47	SOCKET, IC, 68P, PLCC, 821574-1	545-8215-741	1	U12	BW	
48	SOCKET, IC, 44P, PLCC, 821575-1	545-8215-751	1	U7	BW	
49	SCREW, #4-40 x 1/8" LG., BHMS	601-0440-180	2		AW	
50	SOCKET, FOR (3) 7-SEG. DISP., 110-9210	480-9210-110	1	DSN1-3	AW	
51	LOCK WASHER #4 INT. STAR	605-0004-000	8		BW	
52	SOCKET, 16P, SIP, 315-13-116-41-001	545-0116-016	2	DN1-4	AW	
53						
54	DIODE, ZEN., 1.2V REF, LM385B	3001712	1	U3	BW	
55						
56	RESISTOR, CF, 2.2K, 1/4W,5%	303-0222-000	1	R6	AXI	
57	RESISTOR, CF, 3.3K, 1/4W,5%	303-0332-000	1	R4	AXI	
58	RESISTOR, CF, 2M, 1/4W, 5%	303-0205-000	2	R2,3	AXI	
59	RESISTOR, CF, 470 OHM, 1/4W, 5%	303-0471-000	1	R7	AXI	
60	SCREW, MACH, SL PAN HD., 2-56 x 5/8	602-0256-580	2		BW	
61	STANDOFF, METAL, RND., THR. #2-56 x 17/32L	625-1817-256	2		BW	
62	LABEL,BLANK SERIAL NUMBER	550-4426-100	1			NOTE 1

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SIGNATURES		DATE
DRAWN	S. SCHOLL	6-7-93
CHECKED	E. PAVLOCK	5-29-93
ENGR.	B. FAZI	6-7-93
PROJ. MGR.	A. HIRSCHMAN	10/5/93

SEE SHT. 1 FOR REV. LEVEL

MEDRAD INC.
ONE MEDRAD DRIVE
INDIANOLA,PA 15051-0780

TITLE

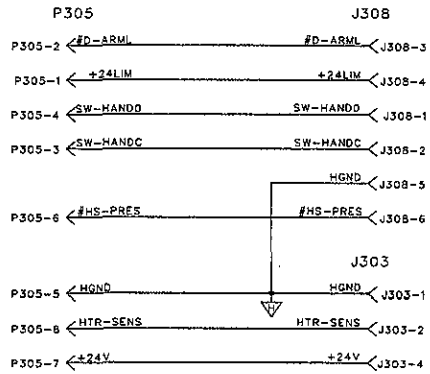
ASSY., CONTROLLER CARD, HCU, ENVISION

DWG. NUMBER 401000408 REV. L

DATE COPIED

SHEET 2 OF 2

REVISIONS				
REV	ECO / ERC NUMBER	DESCRIPTION	CHG BY DATE	APPVD BY DATE
A	10044-CH	CLASS A RELEASE	6-21-95 BJO	



REFERENCE: FABRICATION - 401000472
ASSEMBLY - 401000473

GROUND SYMBOLS		
DIGITAL GROUND	ANALOG GROUND	HI-CURRENT GROUND
CHASSIS GROUND	LAMP GROUND	EARTH GROUND

SIGNATURES		
DRAWN	MAIESE	4-16-93
CHECKED	PAVLOCK	4-16-93
ENGR.	KLODOWSKI	4-16-93
PROJ. MGR.	HIRSCHMAN	9-29-93
DO NOT SCALE DRAWING		

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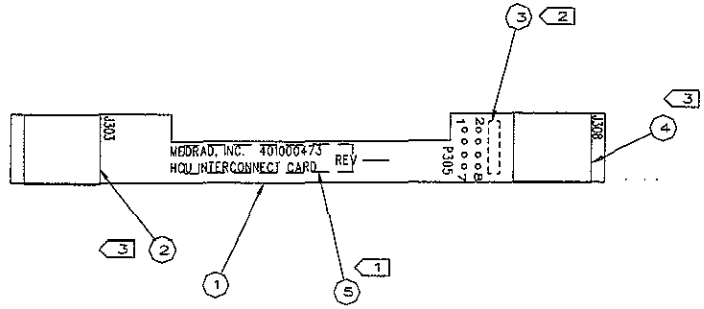
MEDRAD INC.
271 KAPPA DRIVE
PITTSBURGH, PA 15238

TITLE
SCHEMATIC, INTERCONNECT CARD, H.C.U., MCT2.0

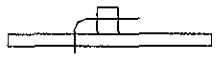
SIZE	DWG. NUMBER	REV
C	401000471	A

SCALE NTS | DATE COPIED | SHEET 1 OF 1

REVISIONS				
REV	ECO NO/EC NO	DESCRIPTION	CHG BY/DATE	APPD BY/DATE
A	10044-QH	CLASS A RELEASE	6-20-95 BJO	DPK 6-23-95
B	EC1915	ITEM 2 WAS J308 ITEM 4 WAS J303	EJP 9-12-95	9-15-95 DPK
C	EC-1984	REVISED NOTE 2	10-31-95 SCG	



3 TRIM LEADS ON J308 AND P305.



2 ITEM 3 TO BE INSTALLED ON THE SOLDER SIDE OF THE BOARD. PINS OF ITEM 3 FACING J308.

1 SERIAL NUMBER AND REVISION TO BE FILLED IN USING PERMANENT INK,OR PRINTED LABEL(ITEM 5). SERIAL NUMBER TO BE INSTALLED ON SOLDER SIDE OF BOARD.

REFERENCE — FABRICATION : 401000472
SCHEMATIC : 401000471

NOTES:

GEOMETRIC TOLERANCES	STD SYMBOLS	UNLESS OTHERWISE SPECIFIED	SIGNATURES	DATE
SYMBOL CHARACTERISTIC	⌀ DIAMETER ⌴ C'BORE ⌵ C'SINK ↧ DEPTH/DP ⏥ SLOPE ⊙ DIM. ORIGIN ▷ CONICAL TAPER XX NOT TO SCALE (XX) REF. DIM.	DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ±.01 3 PL DECIMALS ±.005 FRACTIONS 8"-12" ±1/16 DECIMALS 8"-12" ±1/16 ANGULAR 30'/20' MAX SURFACE TEXTURE 125	DRAWN SCHOLL	6-7-93
			CHECKED PAVLOCK	5-29-93
			ENGR FAZI	6-7-93
			MGMT KLOWDOWSKI	3/23/94

MEDRAD INC.
271 KAPPA DRIVE
PITTSBURGH, PA 15238

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TITLE: ASSEMBLY, INTERCONNECT CARD, HCU, MCT 2.0

SIZE C | DWG NUMBER 401000473 | REV C

SCALE 2X | DATE COPIED | SHEET 1 OF 2

SM - 36

BILL OF MATERIAL

ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE	ITEM	DESCRIPTION	PART NUMBER	QTY.	REF. DESIG.	PROCESS CODE	PREP. CODE
1	PC CARD	401000472	1										
2	CONNECTOR,4 PIN	518-3055-004	1	J303 (B)	AW								
3	HEADER,8 PIN RT/A	518-1040-980	1	P305	AW								
4	CONNECTOR,6 PIN	518-3055-006	1	J308 (B)	AW								
5	LABEL,BLANK SERIAL NO.	550-4426-100	1		AW	NOTE 1							

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SIGNATURES		DATE
DRAWN	SCHOLL	6-7-93
CHECKED	PAVLOCK	5-29-93
ENGR.	FAZI	6-7-93
PROJ. MGR.	KLODOWSKI	3-23-94

SEE SHT. 1 FOR REV. LEVEL

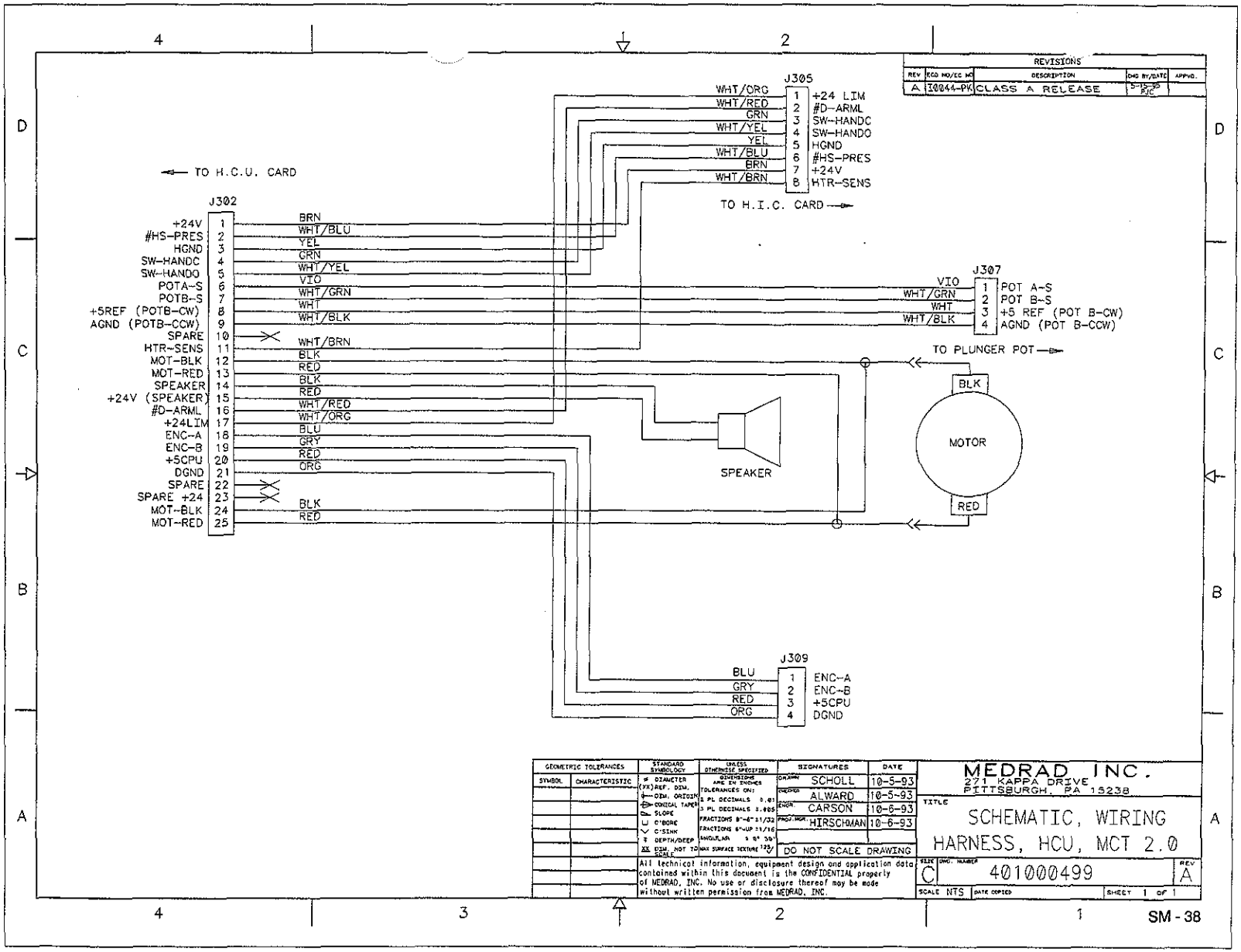
MEDRAD INC.
271 KAPPA DRIVE
PITTSBURGH, PA 15238

TITLE
ASSEMBLY, INTERCONNECT CARD,HCU,MCT 2.0

DWG. NUMBER 401000473 REV. C

DATE COPIED

SHEET 2 OF 2


REVISIONS
REV | ECO NO/EC NO | DESCRIPTION | CHG BY/DATE | APPVD.
A | I0044-PK | CLASS A RELEASE | 5-15-95 PJC
TO H.C.U. CARD
J302
+24V 1 BRN
#HS-PRES 2 WHT/BLU
HGND 3 YEL
SW-HANDC 4 GRN
SW-HANDO 5 WHT/YEL
POTA-S 6 VIO
POTB-S 7 WHT/GRN
+5REF (POTB-CW) 8 WHT
AGND (POTB-CCW) 9 WHT/BLK
SPARE 10
HTR-SENS 11 WHT/BRN
MOT-BLK 12 BLK
MOT-RED 13 RED
SPEAKER 14 BLK
+24V (SPEAKER) 15 RED
#D-ARML 16 WHT/RED
+24LIM 17 WHT/ORG
ENC-A 18 BLU
ENC-B 19 GRY
+5CPU 20 RED
DGND 21 ORG
SPARE 22
SPARE +24 23
MOT-BLK 24 BLK
MOT-RED 25 RED
J305
WHT/ORG 1 +24 LIM
WHT/RED 2 #D-ARML
GRN 3 SW-HANDC
WHT/YEL 4 SW-HANDO
YEL 5 HGND
WHT/BLU 6 #HS-PRES
BRN 7 +24V
WHT/BRN 8 HTR-SENS
TO H.I.C. CARD
J307
VIO 1 POT A-S
WHT/GRN 2 POT B-S
WHT 3 +5 REF (POT B-CW)
WHT/BLK 4 AGND (POT B-CCW)
TO PLUNGER POT
BLK
MOTOR
RED
SPEAKER
J309
BLU 1 ENC-A
GRY 2 ENC-B
RED 3 +5CPU
ORG 4 DGND
GEOMETRIC TOLERANCES
STANDARD SYMBOLOGY
UNLESS OTHERWISE SPECIFIED
SIGNATURES
DATE
DRAWN SCHOLL 10-5-93
CHECKED ALWARD 10-5-93
ENGR CARSON 10-6-93
PROJ. MGR. HIRSCHMAN 10-6-93
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MEDRAD INC.
271 KAPPA DRIVE
PITTSBURGH, PA 15238
TITLE
SCHEMATIC, WIRING HARNESS, HCU, MCT 2.0
SIZE C
DWG. NUMBER 401000499
REV A
SCALE NTS
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SHEET 1 OF 1